REV. GEORGE WILLIAM TAYLOR, F. R. S. C., F. E. S., F. Z. S.

# The Canadian Entomologist

## VOLUME XXXVI.

*Thecla strigosa*, Harr.

EDITED BY

Rev. C. J. S. Bethune, M.A., D.C.L., F.R.S.C.

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# The Canadian Entomologist

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## EXCHANGE.

*Subscribers are invited to make liberal use of this column. Notices over three lines are liable to be shortened if necessary. All insertions free to subscribers.*

MOTHS OF PENNSYLVANIA AND NEW JERSEY.—The undersigned will give good exchange, in cash or specimens, for moths of Pennsylvania and New Jersey that are new to his collection. Send list of rare species only. PHILIP LAURENT, 31 East Mt. Airy Ave., Philadelphia, Pa.

WANTED.—Various specimens and varieties of the genus Eubaphe (Crocota). Other Lepidoptera also desired, especially mounted specimens. Send lists to A. KWIAT, 701 Larrabee St., Chicago, Ill.

WANTED.—Having lately settled in this country (from India), I am much interested in entomology. Any help in forming a collection thankfully received. I will do my best in return, and pay postal charges. N. Am. butterflies specially desired. LYONELL FANSHAWE, Tamarisk, Man.

WANTED.—Lepidopterists desiring Bembecia marginata and var. albicoma to send exchange list of N. Am. moths. HENRY ENGEL, Gen. Delivery, Pittsburg, Pa.

SPIDERS.—I have over 500 specimens of spiders (unnamed) in alcohol, which I will exchange for Hemiptera-Heteroptera. GEO. A. MOORE, 24 Lorne Ave., Montreal, Canada.

GORTYNAS WANTED.—Good prices or exchange will be given for fine specimens of Albilunata, Erepta, U-album, Juvenilis, Medialis, Senilis, Latia, Cerina, Speciosissima, Verona, Frigida, Unimoda, Angelica, Insulidens, Furcata, Sauzaelitæ, Buffaloensis. H. H. LYMAN, 384 St. Paul St., Montreal.

ORTHOPTERA, especially Gryllus, wanted in exchange for any order, except Lepidoptera, from Long Island or Pa. FRANK E. LUTZ, Zoo. Bdg., University of Chicago.

GEOMETRIDÆ of North America wanted for study; any species, however common; in papers preferred. Will exchange and pay postage. DR. BASTELBERGER, Eichberg-Rheingau, Germany.

WANTED.—Aquatic Hemiptera of all descriptions. Will name or collect in other families and orders in return. Write for particulars to J. R. DE LA TORRE BUENO, 437 Central Park West, New York.

WANTED. — Neuropteroid Insects (except Odonata) from all parts of North America; will name or exchange. NATHAN BANKS, East End, Virginia.

TORTRICIDÆ, TINEIDÆ and PYRALIDÆ.—I will identify specimens in these subfamilies, from all N. Am. localities, for privilege of examination and records. Gen. and Sp. names to Dyar's new catalogue. Will also exchange. W. D. KEARFOTT, 114 Liberty St., New York, N. Y.

WANTED.—North American *Geometridæ*, eastern and southern species (many of the commonest). Offered: Lepidoptera, Coleoptera and Hemiptera, named, from British Columbia. GEO. W. TAYLOR, Wellington, B. C.

WANTED.—Lepidoptera from Canada and U. S. A., in papers, correctly named, in exchange for Lepidoptera of the world, correctly named. W. NEUBURGER, Halensee-Berlin, Lutzenstrasse 10, Germany.

EUROPEAN COLEOPTERA.—I have a large quantity of European Coleoptera which I wish to exchange for American. Lists furnished. PAUL J. ROELOFS, 90 Rue van Straelen, Antwerp, Belgium.

# The Canadian Entomologist.

VOL. XXXVI. LONDON, JANUARY, 1904. No. 1

## THE REV. GEORGE WILLIAM TAYLOR, F.R.S.C., F.E.S., F.Z.S.

The readers of the Canadian Entomologist will be pleased, we feel sure, to see the good portrait given herewith of the Rev. G. W. Taylor, who, during the last twenty years, has done such excellent work in almost all lines of Natural History in British Columbia. Born in 1854, in Derby, England, where he received his education, Mr. Taylor, after leaving school, studied mining engineering, but in 1882 came out to Canada and went at once to British Columbia, where he had relatives. Although engaged for a short time in farming, he began almost immediately to study for the ministry, and in 1884 was ordained by the Bishop of Columbia. Since that time, with the exception of two years, from September, 1888, to August, 1890, which he spent in Ottawa as rector of the joint parishes of St. Barnabas and Holy Trinity, he has been in charge of parishes in British Columbia, and at the present time is rector of the Church of England at Wellington, B. C. From boyhood Mr. Taylor has been keenly interested in Natural Science, and from his enthusiasm and industry has accomplished much, not only in doing original work of importance in several lines of Zoology and Palæontology, but in constantly encouraging and assisting others with whom he came in contact, to take up and enjoy with him his favourite studies.

Mr. Taylor has for many years been a Fellow of the Entomological and Zoological Societies of London, England, and in 1884 was elected a Fellow of the Royal Society of Canada in recognition of his eminent services to science, particularly in connection with his investigations in Canadian Conchology and Entomology. In 1887 he was appointed Honorary Provincial Entomologist of the British Columbian Department of Agriculture, and sent out a circular letter to farmers, drawing their attention to the losses caused by insects and asking their co-operation. Owing to his removal to eastern Canada in 1888, this work was relinquished before any report was issued. Several important papers have appeared from his pen in the Transactions of the Royal Society of Canada, the Canadian Entomologist, the Ottawa Naturalist and the Nautilus. Many

new species have been discovered by this energetic worker, and several have been named after him. Among insects, species which have been mentioned in this magazine are *Melitæa Taylori*, Edw. *Anthelia Taylorata*, Hulst, *Ichneumon Taylori*, Harrington, *Trichiosoma Taylori*, Provencher, and *Adranes Taylori*, Wickham. All orders of insects, however, have been studied, and several other species in different orders from those named have been or are being named after the subject of this sketch. Some of Mr. Taylor's best work has been done on the Mollusca, and naturally several new species have been called after him; among those which occur to us are *Pristoloma Taylori*, Pilsbury, *Modiolaria Taylori*, Dall, and *Phyllaphysia Taylori*, Dall; in addition a new species of sponge, *Leucandra Taylori*, Lambe, may be mentioned.

Enormous and valuable collections of British Columbian specimens of various kinds have been made, and generally sent off to specialists in all parts of the world. Mr. Taylor, possesses himself the largest private collection of Limpets (Patellidæ and allied families) in the world; also the most complete collection of Unionidæ in Canada, and one of the largest general collections of land and water shells (7,000 species) in Canada.

A constant collector of insects, Mr. Taylor has also amassed valuable collections in several orders, notwithstanding the fact that he has made a practice continually of giving away to specialists any specimens which were required for study. His cabinets contain a wealth of representative specimens of inestimable value to the many beginners who have been stirred up by his enthusiasm to investigate the insect fauna of our Pacific Coast Province. At the present time he is devoting all his energies to the working up of the North American Geometridæ, paying particular attention to northern species which are likely to occur in Canada. Since the death of the Rev. G. D. Hulst, this important family of moths has been somewhat neglected by American students. Mr. Taylor's methods of work are systematic and thorough. First securing all the literature on the subject under consideration, he then strives to acquire types for study from the original localities, compares them with the descriptions, and then with extensive series of specimens from as wide an area as possible. He is an indefatigable collector and generous correspondent, who considers no trouble too much to make observations or secure specimens when specially desired. In his parish work he is painstaking, gentle and self-denying, always ready to help; a clear and forcible preacher, and an earnest liver who shows in his works that religion is not an accessory of everyday life, but an integral part of it. J. F.

## OTTAWA FIELD-NATURALISTS' CLUB.

The 25th anniversary of the foundation of this active and useful organization was celebrated in the large assembly hall of the Normal School on Tuesday evening, December the 15th, and proved of much interest to the large audience present. The inaugural address of the president, Mr. W. T. Macoun, dealt with the present work of the Club, and of projects for the future. Principal White, of the Ottawa Normal School, in a concise and well-expressed address of welcome, attested to the public appreciation of the efforts of the Club, and the important work they were engaged in in connection with the educational institutions of the city. All the speakers were members of the first Council of the Club in 1879.

Lieut.-Col White, C. M. G., the first president of the Club, spoke upon Natural History at Ottawa before the formation of the Club, giving many pleasing reminiscences of former workers, and the difficulties under which they laboured.

Mr. Robert B. Whyte spoke upon "Botanical Conditions around Ottawa twenty-five years ago." He went carefully over the old hunting-grounds, many of which are now covered with buildings, and recalled with pleasure the finding of special rarities, and the companionship of friends bound together by ties of mutual scientific interest. He spoke particularly of the delight of the Honourable Joseph Martin, who at that time was an enthusiastic student of botany, when he found his first plant of the Showy Lady's Slipper.

Dr. Fletcher dealt with "Ottawa as a Natural History locality twenty-five years ago." He reviewed in order the old localities which were most productive for the naturalist, mentioning some of the rarer objects found, and drew attention to the changes which had obliterated some of these since the Club started; but pointed out that there was still much to be done close to, or even within the city limits, in the different branches of Natural History. Reference was made to the great stimulus given to scientific work in Ottawa by the advent of the Geological Survey of Canada.

Lieut.-Col. Anderson gave an address upon the "Workers in Natural History at Ottawa twenty-five years ago," paying a tribute to the good work done, and to the constancy with which the enthusiasm had been kept up. A striking feature was the encouragement which had always been given to beginners by the leaders.

Dr. H. B. Small's subject was, "What the Ottawa Field Naturalists' Club has accomplished." He recalled many interesting characters and

incidents connected with the foundation of the Club, showing how it had developed from a mere bond, holding a few enthusiasts together, into an active and influential organization, taking an important part in the educational development of the country. In addition to having in a large measure effected its prime object of working up the local natural history of the Ottawa district, it had provided opportunities for delightful recreation and improvement to the many hundreds, or even thousands, of lovers of the country and of natural history, who had, during the twenty-five years, attended the excursions and evening meetings where the popular presentation of science had always been kept well to the front.

The meeting ended with short and appropriate speeches by Dr. Robert Bell, the director of the Geological Survey, and Prof. Macoun, the eminent botanist. A vote of thanks was proposed by Mr. W. H. Harrington, and seconded by Mr. James Ballantyne, in a happy manner.

## A NEW FOOD-PLANT FOR THE COMMON SPRING BLUE.

*Cyaniris ladon*, Cramer, *a. lucia*, Kirby.

This is the new name for our old friend, *Lycæna pseudargiolus*, var. *lucia*. An interesting observation was made on the oviposition of this species by Mr. C. H. Young, of Ottawa. On June 4th, when at Meech Lake, Que., noticing a female *lucia* fluttering around a patch of the common Ox-eye Daisy, *Chrysanthemum leucanthemum*, L., he watched it carefully and saw that it was laying eggs upon the buds of this plant. In no case was a full-blown flower visited, the eggs being invariably laid on the small buds, which were from a quarter to three-eighths of an inch in diameter. After watching the insect for some time, the three last buds visited were gathered and the eggs secured. The operation of egg-laying was, as is usually the case with this species, as follows: Settling on the top of a flower, the female crawled to the edge of the bud, and then turning her abdomen down beneath it thrust the egg as far out of sight as possible, just at the base of the bracts, where there is a slight swelling which hides them to a certain extent. The only plants belonging to the Compositæ recorded by Dr. Scudder as food-plants of *Cyaniris ladon (Pseudargiolus)* are *Verbesina helianthoides* and *Actinomeris squarrosa*, neither of which occurs in Canada. The other plant inadvertently stated by Dr. Scudder as belonging to the Compositæ, *Dimorphanthus mantchuricus*, is a member of the Ginseng family, Araliaceæ.—J. FLETCHER.

# CLASSIFICATION OF THE FOSSORIAL, PREDACEOUS AND PARASITIC WASPS, OR THE SUPERFAMILY VESPOIDEA.

BY WILLIAM H. ASHMEAD, M. A., D. SC., ASSISTANT CURATOR, U. S. NATIONAL MUSEUM.

(Paper No. 18.—Continued from Vol. XXXV., p. 332.—Conclusion.)

## SUBFAMILY II.—Ephutinæ.

This subfamily is readily separated from the *Mutillinæ* by the difference in the abdomen, both sexes having the first segment much narrowed, or petioliform, and separated from the second by a more or less distinct constriction or furrow; it is never broadly sessile with the second as in the *Mutillinæ*.

The group is based upon the genus *Ephuta*, Say, as I have restricted it, but not as defined by André. Say, in his original brief description, designated no type for the genus, but placed under it *three* species, namely, *Mutilla erythrina*, Klug; *M. scrupea*, Say, and *M. gibbosa*, Say. When I recognized the genus I designated as the type *E. scrupea*, Say, the only species I knew in both sexes. As I was the first to designate a type for it, my views should prevail; in fact, must prevail under the rules of zoological nomenclature.

The genus *Rhoptromutilla*, André, is *Ephuta*, Say, as I defined it under a new name.

Of my genus *Allomutilla* Mr. André says: "Ce genre a été fondé par Ashmead sur le ♂ de *D. melicerta*, a Smith, qui d'après l'auteur cité, présenterait cette particularité d'avoir les deux nervures récurrentes recues par la seconde cellule cubitale, or cette assertion est erronée, car chez le ♂ en question dont j'ai pu examiner plusier examplaires, les nervures recurrentes sont recues comme d'ordinaire, par le 2e et 3e cellules cubitales."

My definition is correct, and André's several examples of *M. melicerta*, Smith, probably represent some other species. Radoszkowski, in Horæ Soc. Ent., Rossicæ, Vol. VI., 1869, Pl. 10, Fig. 4, gives a good figure of *M. melicerta*, Smith, and if Mons. André will consult this figure he will see that *the second cubital cell receives both recurrent nervures*, as I have stated. Another species figured by Radoszkowski, *Mutilla egregia*, Klug, also has the same venation and will fall into *Allomutilla*, Ashmead.

The subfamily *Ephutinæ* is divided into two tribes as follows:

Table of Tribes.

Eyes never rounded or hemispherical, but always ovate, obovate or ellipsoidal, not polished, and distinctly facetted, as in the tribe *Mutillini*.....Tribe I., Ephutini.

Eyes rounded or hemispherical, very prominent and highly-polished, not facetted, or the facets very indistinctly defined, as in the tribe *Photopsidini*.....Tribe II., Sphaerophthalmini.

Tribe I.—Ephutini.

Table of Genera.

Males.....1.

Females.....9.

1. Eyes distinctly emarginate within.....2.

Eyes *not* emarginate within.....4.

2. Metathorax with the hind angles normal, not dentate; scutellum normal, not spined.....3.

Metathorax with the hind angles dentate, clothed with a dense silvery-white pubescence; scutellum bispined. (North and South America).....Ephutopsis, Ashm., gen. nov.

(Types E. trinidadensis, Ashm., and M. odontophora, Cam.)

3. Second and third cubital cells each receiving a recurrent nervure.

Scape bicarinate beneath, the first and second flagellar joints transverse, or not longer than thick; first segment of abdomen petioliform, as wide at base as at apex. (North and South America.).....Ephuta, Say.

= Rhoptromutilla, André.

(Type E. scrupea, Say.)

Scape (?) not bicarinate beneath; first segment of the abdomen narrowed anteriorly, nodiform posteriorly.

(Africa.).....Rhopalomutilla, André.*

(Type R. clavicornis, André.)

Second cubital cell receiving both recurrent nervures; scape normal.....Allomutilla, Ashmead.

(Type Mutilla melicerta, Smith.)

4. Front wings with *three* cubital cells, or the third partially formed...5.

Front wings with *two* cubital cells, the third entirely absent.....6.

*I have not seen a specimen of this genus, and am not positive of its position in this tribe.

5. Middle and posterior tibiæ *not* spinous; second ventral segment with a longitudinal impresssion on each side filled with a dense pubescence. (Europe, Africa and Asia.).....Stenomutilla, André. (Type Mutilla argentata, Villiers.)

Middle and posterior tibiæ spinous; second ventral segment normal. (Europe, Africa and Asia.).....Dasylabris, Radoszowski. (Type Mutilla arenaria, Fabr.)

6. Head normal, unarmed.....7.

Head abnormally large, quadrate, armed on each side beneath with a tooth or spine, the hind angles acute or straight.....8.

7. Stigma in front wings indistinct; mesonotum *without* furrows, or the furrows only slightly indicated; first joint of the flagellum shorter than the second.....Dasylabris, Radoszk. (partim.)

Stigma in front wings well developed; mesonotum *with* distinct furrows. (Europe and North Africa.).....Cystomutilla, André. (Type Mutilla ruficeps, Smith.)

8. Marginal cell squarely truncate at apex; second recurrent nervure subobsolete; first joint of the flagellum longer than the second. (North and South America.).....Hoplomutilla, Ashmead. (Type Mutilla cephalotes, Swederus.)

9. Thorax obpyriform, ovate or ovoid; head not unusually large....10.

Thorax banjo-shaped, or nearly; head very large, quadrate, about twice as wide as the thorax.....16.

10. Pygidium smooth, *without* a pygidial area, or at most the area only slightly indicated, rarely finely, sparsely punctate.....11.

Pygidium not or rarely smooth, opaque, striate or rugulose, always *with* a distinct pygidial area.....14.

11. Thorax bare, or with only a few sparse hairs; eyes ovate or oval; first abdominal segment petioliform, as wide at base as at apex; metathoracic spiracles round or short oval.....12.

Thorax not bare, densely pubescent above; eyes ellipsoidal or short oval; first abdominal segment subnodose at apex; metathoracic spiracles long, linear.....13.

12. Head transverse, much wider than the thorax, the temples obliquely narrowed; eyes rather large, oval.....Ephutopsis, Ashmead.

Head transverse or subglobose, not much wider than the thorax; eyes ovate or oval; flagellum not long, either subclavate or clavate, the first joint transverse, a little shorter than the second, the following short, wider than long; hind tibiæ with a few sparse hairs.....Ephuta, Say.

13. Head subglobose; flagellum filiform, the first joint obconical, longer than the second, the following joints longer than thick; mandibles with a tooth within before apex.....Stenomutilla, André.

14. Thorax longer, obpyriform or obovate.....15.

Thorax short, obovoid, above bare or nearly; metathoracic spiracles (?) oval; mandibles bidentate; abdomen red and black, with the first segment petioliform, of an equal width throughout.....Allomutilla, Ashmead.

15. Thorax bare; head subquadrangular; eyes very small, placed towards the middle of the sides of the head; antennæ very short, strongly clavate, the joints of the flagellum wider than long.....Rhopalomutilla, André.

Thorax usually densely pubescent, the metathoracic spiracles long oval; mandibles tridentate at apex, or with one or two teeth within before the apex; antennæ neither very short nor strongly clavate, the first joint of the flagellum longer than the second; abdomen usually spotted with silvery-white or golden pubescent spots, the petiole short, widest behind.....Dasylabris, Radoszkowski.

16. Head with the hind angles acute or dentate, armed beneath with *four* teeth, *i.e.*, two small teeth at base of gula and a large tooth on each side behind these; mandibles bidentate, the lower tooth much the longer.....Hoplomutilla, Ashmead,

## Tribe II.—Sphaerophthalmini.

The members of this tribe exhibit the strongest affinity with those in the tribe *Photopsidini*, and many females are easily confused with some in the latter.

The closest attention, therefore, must be given to the difference in the shape of the first abdominal segment, made use of in separating the tribes, before they can be recognized.

### Table of Genera.

Males.....1.

Females.....7.

1. Fully winged.....2.

Subapterous or with rudimentary wings.

Thorax ovoid, coarsely sculptured, or rugosely punctured, with a black pubescence; head rather large, quadrate, wider than the thorax; eyes small, rounded; mandibles 3-dentate; first joint of the flagellum not short, but hardly longer than the second. (North America.).....Pycnomutilla, Ashm., gen. nov.

(Type Mutilla waco, Blake.)

2. Front wings with only *two* cubital cells.....3.
Front wings with *three* cubital cells, or the third partially formed..7.
3. Marginal cell at apex broadly truncate.....4.
Marginal cell at apex pointed or rounded, never truncate.
4. Mandibles at apex broad and 3-dentate.....5.
Mandibles at apex never broad nor 3-dentate, at the most bidentate 6.
5. Body bare, or nearly; second dorsal abdominal segment not black, red or marked with red or yellow spots. (North and South America.).....Sphaerophthalma, Blake.
= Traumatomutilla, André.
(Type S. scaeva, Blake.)
Body not bare or nearly, usually very hairy or pubescent; second dorsal abdominal segment usually black or unicolorous, not spotted with red or yellow. (North and South America).....Dasymutilla, Ashmead.
(Type Sphaeroph. gorgon, Blake.)
6. Body well pubescent or hairy, the abdomen black, with a white hair-band; first joint of the flagellum shorter than the second. (South America.).....Reedia, Ashm., gen. nov.
(Type Mutilla atripennis, Spinola.)
7. Thorax obpyriform or obovate, or at least always narrowed posteriorly.
Mandibles at apex *not* 3-dentate, edentate, or with a small tooth within some distance from the apex, or bidentate.....8.
Mandibles at apex obliquely truncate and 3-dentate.
First joint of the flagellum obconical, but not twice as long as the second; head and thorax usually black, with a sparse black pubescence, rarely with the head red; second abdominal segment mostly red....Pycnomutilla, Ashmead.
8. Body bare or nearly, never densely pubescent, or hairy, usually rugosely punctured; scape rather long, slightly bent, the first joint of the flagellum longer than the second; second abdominal segment marked with from 2 to 4 red or yellow spots, rarely immaculate.....Sphaerophthalma, Blake.
= Traumatomutilla, André.
Body *not* bare, but clothed with dense long hairs or densely pubescent, or the head and thorax above with a dense pubescence; second abdominal segment usually black or the *derma* not spotted, although the segment is sometimes spotted with two or more pubescent spots.....Dasymutilla, Ashmead.

## SEVERAL NEW DIPTERA FROM NORTH AMERICA.

BY D. W. COQUILLETT, WASHINGTON, D. C.

### Family CULICIDÆ.

*Culex Dupreei*, new species.—Female. Near *serratus*, but much smaller, the white-scaled median vitta of the mesonotum broader, widening posteriorly where it is wider than the brown lateral portion, etc. Black, the bases of antennæ, lower part of pleura, the metanotum, basal portion of venter, coxæ, and femora, yellowish; scales of palpi black, those of occiput white, and with a spot of black ones each side; scales of middle of mesonotum white, those on the sides brown, on the pleura and scutellum white; scales of abdomen brown, those in the basal angles of the segments and on the venter white; scales of femora yellowish, those on front side of first two pairs, and on apical portion of upper side of hind ones, chiefly brown, those of tibiæ and tarsi brown; tarsal claws toothed; wings hyaline, lateral scales of the veins narrow and linear, petiole of first submarginal cell about one-third the length of that cell, hind crossvein about its length from the small; length, slightly over 2 mm.

Male.—Colours as in the female, but the mesonotum nearly covered with white scales; penultimate joint of palpi considerably dilated, the last joint narrow, front and middle tarsi with one tooth under one of the claws, none under the other, petiole of first submarginal cell nearly as long as the cell.

Baton Rouge, Louisiana.—A specimen of each sex received from Mr. J. W. Dupree, after whom the species is named. Type No. 7340, U. S. National Museum. Mr. Dupree writes that the eggs and larvæ of this species are very distinct from those of *serratus*. A small series bred by Dr. J. B. Smith, at New Brunswick, New Jersey, has also been examined.

*Conchyliastes varipes*, new species.—Near *musicus*, but the last joint of the hind tarsi is brown. Black, the front and hind femora, except their broad apices, the posterior side of the middle femora except their apices, and the stems of the halteres, yellow, the fourth joint of the hind tarsi white; scales of palpi violaceous, those of the occiput yellowish white and with a patch of violaceous ones on either side; (mesonotum abraded; what scales remain are yellowish white and a few black ones along the middle); scales of abdomen violet blue, those on sides of first two

segments, hind angles of the others except the last one, under surface of each segment except the last one and base of the preceding, whitish; scales on yellow portion of femora yellowish white, those on the remainder and on tibiæ violet blue, those on the tarsi black except on the fourth joint of the hind tarsi, where they are white, claws of front tarsi toothed; wings grayish hyaline, veins and scales brown, petiole of first submarginal cell from two-fifths to three-fifths as long as that cell, hind crossvein less than its length from the small; length, 4 mm. Five female specimens. Type No. 7341, U. S. N. M.

Las Penas and Tonala, Mexico (Dr. A. Dugès), and Agricultural College, Mississippi (May 18, Glenn W. Herrick).

Family CHIRONOMIDÆ.

*Metriocnemus Knabi*, new species.—Black, the knobs of the halteres whitish, hairs of antennæ brown, those of the body yellowish; mesonotum somewhat polished, front tibiæ twice as long as the first joint of their tarsi, hind tibiæ outwardly fringed with rather long hairs, all tarsi with a short pubescence, but without hairs, the fourth joint slender and longer than the fifth; wings grayish hyaline, densely covered with brown hairs, third vein almost straight; length, 1.25 to 2 mm Two males and four females bred by Mr. Fred Knab, after whom the species is named. Type No. 7321, U. S. N. M.

Westfield, Massachusetts. This European genus of Chironomidæ has not heretofore been recorded from this country.

Family OESTRIDÆ.

*Cuterebra grisea*, new species.—Near *fontinella*, but the hairs of the mesonotum are whitish; also near *scutellaris*, but the last abdominal segment is largely opaque, gray pruinose. Black, the abdomen and legs dark reddish brown; front at vertex one and one-half times as wide as either eye, its hairs black and with several yellow ones on the lower portion, two gray pruinose spots along each eye and one on either side of insertion of antennæ; face and cheeks densely gray pruinose, the upper portion of sides of face broadly, a triangular spot on either side of lower part of facial cavity, a small spot at lower end of each eye and one nearly midway between it and the oral margin, also two streaks along the anterior portion of the latter, polished, margins and lower portion of facial depression, except in the middle, also polished, hairs of face and cheeks whitish, those on upper portion of face chiefly black; (antennæ wanting);

thorax gray pruinose, its hairs whitish, those of the hypopleura, middle of breast and scutellum black; a row of three polished spots near the lower front corner of the pleura; abdomen polished, the last segment and venter of the last three gray pruinose, several spots and the hind margin of the last segment polished, hairs of abdomen black, those of the last segment and venter of the last three chiefly yellow; legs polished, an elongate, whitish pruinose spot on front side of middle femora, hairs black, those on inner side of apical half of front tibiæ golden yellow, on inner side of other tibiæ chiefly white; wings brown, veins yellow, calypteres dark brown; length, 15 mm.

Fort Simpson, B. C., Canada. A single specimen collected by the Rev. J. H. Keen, and submitted for naming by Dr. James Fletcher, to whom the type has been returned.

Family SCIOMYZIDÆ.

*Bischofia varia*, new species.—Black, the head except middle of face, basal half of antennæ, mouth-parts, pleura, sternum and scutellum, reddish brown, the halteres, sides of abdominal segment, coxæ, trochanters, middle legs except apical half of femora, and nearly basal half of hind femora, yellow; head and body polished, frontal lunule hidden, antennal arista sparsely long-plumose, face strongly produced forward at the oral margin, mesonotum bearing two pairs of dorsocentral bristles, no acrostichals, mesopleura bare, pteropleura bearing two bristles, one above the other, and several short hairs, sternopleura covered with short hairs, hind femora without long hairs or bristles on the under side; wings hyaline, veins broadly bordered with brown, least distinct on the sixth vein, tip of first vein slightly before the small crossvein, calypteres whitish; length, 6 mm.

Rigaud, Quebec, Canada.

A female specimen collected May 24, 1902, by Mr. G. Chagnon, and submitted by Mr. C. W. Johnson, of Boston, Mass., to whom it has been returned by request.

This European genus was founded by Hendel in the Kais. Konig. Zool-bot. Gesell. Wien, II., page 52, 1902, and besides the present form the *Dryomyza aristalis*, Coquillett, also belongs to this genus. The latter is closely related to *Dryomyza*, differing in the possession of a propleural bristle, a preapical pair of bristles on each front tibia, etc.

## RECORDS OF AMERICAN BEES.

BY T. D. A. COCKERELL, COLORADO SPRINGS, COLO.

*Chelostoma Neomexicanum*, n. sp.

♀.—Length about 8 mm., black, with distinct narrow white hair-bands on abdomen. Middle of anterior margin of clypeus curved upwards, presenting a point from which the sides slope gently for some distance, and then abruptly nearly vertically, the whole, seen from beneath, having about the outline of a low house seen from one end; some distance on each side of this structure is a low projection of the margin. In general, the insect looks just like *Ashmeadiella bucconis*, but the second tooth of the mandibles is short, and the front and vertex are as densely punctured as it is possible for them to be. The last joint of the labial palpus is conspicuously longer than the penultimate one.

*Hab.*—Barela Mesa, New Mexico, at flowers of blue-bell; June 28, 1903. (*Anna Gohrman.*) The genus is new to New Mexico. The species will be easily known by the clypeal structure, as described. Miss Gohrman also collected *Osmia Bruneri*, Ckll., at flowers of blue-bell at Barela Mesa, June 28. The species is new to New Mexico. At the same place, and on the same day, she also collected *Anthidium maculosum*, Cr., ♂ (at loco flowers), and *Synhalonia frater*, Cr.

*Halictus clematisellus*, n. sp.

♀.—Length about 5 mm.; head and thorax olive green; abdomen shining bright orange-ferruginous, not at all dusky at apex, the third and fourth segments each with a small round black spot near the base on each extreme side; wings short, iridescent; tegulæ, nervures and stigma pale testaceous. In nearly all respects this agrees with *H. pictus*, Crawford, but it differs conspicuously in having the abdomen only very scantily pubescent, and the enclosure of the metathorax (except the broad shining rim) entirely covered with strong vermiform rugæ. The clypeus (except its upper margin) is wholly purplish-black, with very large, sparse punctures, and no testaceous border; the supraclypeal area is more or less brassy. The knees, apices of tibiæ, and tarsi more or less, are ferruginous. Antennæ black, flagellum dark brownish beneath. Mesothorax strongly and rather closely punctured on a microscopically tessellate surface. First abdominal segment smooth, with sparse, very minute punctures; second, with equally small but rather closer punctures, and more or less transversely striatulate basally. Hind spur of hind tibia with few, large teeth. Belongs to Robertson's group *Chloralictus*.

*Hab.*—Pecos, New Mexico, July 14, 1903. (*W. P. Cockerell.*) It occurs in numbers at flowers of *Clematis ligusticifolia*, but has been seen on no other plant.

*Trypetes carinatum* (Cresson).

Prof. C. H. T. Townsend has taken this at Tlacotalpam in Vera Cruz, Mexico, April 21. I cannot see any difference between the specimen and those found in the United States. The genus is new to Mexico.

*Colletes Wilmattæ*, n. sp.

♀.—Length 10 mm.; almost entirely covered with short pale yellow pubescence; legs red. Palpi ferruginous, with subequal joints, the basal ones a little the longer; malar space very short, at least twice as broad as long; mandibles black, with a faint red stain in the middle; labrum convex, shining, with a row of shallow pits; clypeus confluently punctured; antennæ short, black or nearly so, scape brownish, second joint very distinctly brown; prothoracic spines short; mesothorax shining and densely punctured, but the surface entirely concealed by the short hair; even the metathorax is covered with hair; tegulæ small, pale testaceous; wings very short, quite clear, the small stigma and the nervures pale ferruginous; second submarginal cell broader than high; abdomen rather parallel-sided, long, the dorsal surface entirely covered with very short pubescence, except the apical segment, which is dark brown and nearly bare, strongly contrasting.

*Hab.*—Pecos, N. M., Aug. 9, 1903. (*T. D. A. & W. P. Cockerell.*) Flying over damp ground by the Pecos River. A very distinct and beautiful species. The character of the pubescence allies it with *C. aberrans*, Ckll., while the red legs and some other characters curiously suggest the Brazilian *C. rufipes*, Smith. The insect also reminds one of *Dasiapis ochraeea*, Ckll.

## NOTES ON NORTH AMERICAN STRATIOMYIDÆ.

BY A. L. MELANDER, CHICAGO.

While arranging the flies of this family contained in the Garry de N. Hough collection of the University of Chicago, together with my own material, a number of notes have been made, which are here given. This family, like a number of other dipterous groups, needs monographic study owing to the confused and scattered descriptions of most of the forms. Of recent years the number of genera has been multiplied,

although the authors have neglected to sift out the older species belonging to these new groups. Accordingly, the older genera, like *Sargus* for example, contain species of several of the modern subdivisions.

In the following pages are listed the species studied, together with the localities from which they were received. Analytical keys are introduced for several of the genera as an aid to the future student. I here wish to thank my friend, Mr. Charles T. Brues, for supplying descriptions not accessible in this city.

### ALLOGNOSTA.

Our three species are related thus :

Discal cell not as broad as the stigma ..... 2.

Discal cell as broad as the stigma ; abdomen testaceous centrally ..... *fuscitarsis*, Say.

2. Abdomen testaceous centrally ..... *similis*, Loew.
Abdomen wholly black ..... *obscuriventris*, Loew.

*A. fuscitarsis*, Say.

Edgebrook and Algonquin, Ill.; Kiamesha, N. Y. June.

*A. obscuriventris*, Loew.

Edgebrook, Ill. June. This species occurs in company with the preceding in open woodland.

### BERIS.

But two species occur in the United States. They have the thorax metallic green and the abdomen black.

Scutellum with four spines ..... *viridis*, Say.
Scutellum with six or eight spines ..... *Mexicana*, Bell., Will.

*B. viridis*, Say.

New Jersey (vi., 3, '01) ; Michigan ; Glen Ellyn, Ill. (v., 30, '99).

*B. Mexicana*, Bellardi, Williston.

One specimen from Vancouver Island (Livingston, vii., 14, '96) agrees with Dr. Williston's redescription of this species. (CAN. ENT., 1885, p. 123).

### SARGUS.

The species grouped under the old genus *Sargus* are many of them superficially described. Accordingly, it would be difficult to decide to which subdivision most of the species belong. So far the species described under the generic name *Sargus* may be distributed among the following groups :

Non-metallic species ..... *Ptecticus*, Lw.*
More or less metallic species.
Eyes contiguous or subcontiguous, ♂ ; ocelli equidistant
Abdomen long, pedicellate, cylindrical at the base ..... *Macrosargus*, Bigot.
Abdomen short, broad and flattened ..... Spp. *elegans*, Lw., and *Texana*, sp. n.
Eyes, ♂ ♀, separated ; front ocellus further from the other two ..... *Sargus*, s. str.

The assignment of the species in the following table is based almost entirely on their descriptions, and hence can not be relied upon with absolute certainty. Many species are known from one sex alone, many are poorly described, and as we know that there is great variability in colour in some of the species, it seems certain that the species are less numerous than their descriptions. All the species that have been recorded as from North America are included in the table. To the future student who has a sufficiently large collection is left the task of solving the synonymy.

Abdomen petiolate ; eyes of male contiguous or nearly so ; ocelli equidistant (*Macrosargus*, Bigot) ..... 2.
Abdomen not clavate ; eyes generally separated and front ocellus generally further from the others ..... 11.

2. Thorax reddish, more or less metallic posteriorly ..... 3.
   Thorax completely metallic green ..... 4.
3. Abdomen dark green ; antennæ black ..... *linearis*, Loew.
   Abdomen reddish, with four black fasciæ ..... *smaragdiferous*, Bigot.
4. Abdomen entirely metallic, cupreous ..... 5.
   Abdomen with the second segment yellow ..... *coarctatus*, Macquart.
5. Scutellum margined with red; face more or less black pilose (*filiformis*, Gilio Tos) ..... *cæsius*, Bellardi.
   Scutellum wholly green or gold-green ..... 6.
6. Wings blackish ..... *clavatus*, Walker.
   Wings at most brown ..... 7.
7. Abdomen black with bronze lustre ..... *clavis*, Williston.
   Abdomen cupreous with green lustre ..... 8.
   Abdomen golden at base, aeneous at tip ..... *aureus*, Bellardi.

*(Of the species in Osten Sacken's Catalogue, *Sargus trivittatus*, Say, and *S. subinterruptus*, Bellardi, belong here.)

8. Pile black ..... *alchidas*, Walker.
Pile fulvous ..... 9.
9. Mesonotum with a white spot... sp. innom., Osten Sacken, Williston.
Mesonotum not marked with a white spot ..... 10.
10. Pleura green; vertical triangle longer ..... *lucens*, Loew.
Pleura yellow; vertical triangle shorter ..... *lateralis*, Macquart.
11. Legs black, at least the hind femora more or less black ..... 26.
Legs largely yellow; at most the hind legs with brown markings.. 12.
12. Abdomen unicolored, not fasciate ..... 13.
Abdomen purple with yellow fasciæ ..... 25.
13. Abdomen reddish or yellowish, at least at base, sometimes with more or less cupreous tinge ..... 14.
Abdomen black, green, violet, or cupreous, not light coloured.. .17.
14. Pleura yellow, eyes of male contiguous ..... *elegans*, Loew.
Pleura black or concolorous with the dorsum ..... 15.
15. Face and front reddish yellow ..... 16.
Face and front metallic green; wings hyaline; length 3 mm ..... *bicolor*, Wiedemann.
16. Abdominal segments with lateral triangles; wings light brown (not *pallipes*, Say) ..... *pallipes*, Bigot.
Abdomen aeneous at the tip; wings hyaline ..... *debilis*, Walker.
17. Pleura yellow, wholly or partly ..... 18.
Pleura black or dark metallic ..... 20.
18. Legs varied with brown; stigma blackish ..... 19.
Legs completely yellow; stigma fuscous ..... *pleuriticus*, Loew.
19. Thoxax blue-green; length 7 mm ..... *cæruleifrons*, Johnson.
Thorax violet; length about 16 mm ..... *splendens*, Bigot.
20. Front testaceous; scutellum margined with yellow ..... 21.
Front metallic, except sometimes for two white spots ..... 22.
21. Abdomen blue; veins yellow ..... *versicolor*, Bellardi.
Abdomen green; veins dark ..... *bagosus*, Walker.
22. Face yellow; thorax violet ..... *sapphireus*, Bigot.
Face black; thorax green ..... 23.
23. Eyes of male contiguous; ocelli equidistant; abdomen short and broad, green ..... *Texanus*, sp. nov.
Normal *Sargus*-species; abdomen slender ..... 24.
24. *Sargus decorus*, Say.
abdomen green ..... *punctifer*, Bigot.

abdomen cupreous.....*picticornis*, Bigot.
*xanthopus*, Wiedemann.
abdomen piceous.....*decorus*, Say.

25. Hind legs varied with brown.....*stamineus*, Fabricius.
Tip of hind tarsi only brown.....*tricolor*, Loew.

26. Thorax and abdomen violet green, concolorous.....27.
Thorax violet or green, abdomen not concolorous.....28.
Thorax red above, scutellum dark; abdomen yellow at base; fore legs pale.....*concinnus*, Osten Sacken.

27. Legs entirely black; antennæ black (*nigribarbis*, Bigot). *viridis*, Say.
Legs in part yellow; antennæ yellow.....*nigrifemoratus*, Macquart.

28. Wings with a brown cloud at middle (*nubeculosus*, Zetterstedt).....*cuprarius*, Linnæus.
Wings uniformly yellowish; front legs pale.....29.

29. Abdomen uniformly metallic.....30.
Abdomen with a white vitta.....*Sallei*, Bellardi.

30. Abdomen cupreous violet.....*speciosus*, Macquart.
Abdomen aeneous.....*latus*, Bellardi.

Of these species the following are not listed in Osten Sacken's Catalogue:

*splendens*, Bigot, Ann. Soc. Ent. France (5), ix., p. 224. 1879. Mex.
*nigribarbis*, Bigot, ibid., p. 224. Cal. (=*viridis*, Say.)
*clavis*, Williston, Can Ent., xvii., p. 123. 1885. Va., N. C.
*punctifer*, Bigot, Ann. Soc. Ent. France (6), vii., p. 27. 1887. Col.
*picticornis*, Bigot, ibid., p. 27. Wash.
*pallipes*, Bigot, ibid., p. 28, Oregon.
*sapphireus*, Bigot, ibid., p. 28, Cuba.
*concinnus*, Osten Sacken, Biologia Centr.-Amer. Dipt.
sp. innominata, Osten Sacken, ibid., p. 23. Mex.
Williston, ibid., Suppl., p. 231.
*filiformis*, Gilio Tos, Bull. Mus. Zool. Torin. 1891, No. 102. Mex. (=*cæsius*, Bell.)
sp. innominata, Townsend, Ann. N. Hist., xix., p. 18. 1897. Mex.
*cæsius*, Bellardi, Williston, Biol. Centr.-Amer. Dipt. Suppl., p. 232.
*cæruleifrons*, Johnson, Ent. News, Phila., xi., p. 325. New Jersey.
*cuprarius*, Linn, etc. A common European species.
*coarctatus*, Macq., etc. A Brazilian species, taken also in Mexico.
*Texanus*, sp., nov. Described herewith.

Notes on the distribution of the specimens of *Sargus* studied.

1. *lucens*, Loew. Several specimens from Hayti.

2. *cuprarius*, Linn. This is the species known as *nebeculosus*, Zett., in collections. Not rare. Woods Hole, Mass. (July); Newark, N. J. (June); Penn.; Chicago, Ill. (June-July).
3. *decorus*, Say. Kiamesha, N. Y. (June); New Bedford, Mass. (May); Phila, Penn.; Ontario; Algonquin and Chicago, Ill.; Austin, Tex.; Vancouver Island. June and July.
4. *viridis*, Say. Mich.; London, Ontario; Chicago, Ill.; Denver, Col. May and June.
5. *elegans*, Loew. Opelousas, La. May and June.
6. *Texanus*, sp. nov.

*Male:* Eyes contiguous, subcontiguous in front of the antennæ; front and face black; antennæ reddish, the style black; proboscis yellow; ocelli equidistant, ocellar triangle metallic black, with fulvous pile. Thorax polished green, scutellum and metathorax somewhat more bluish; pile of thorax fulvous, erect, appearing dense when viewed from the side; humeri and a line to the root of the wing yellow; pleura black. Abdomen metallic green, with erect fulvous pile, sexual organs testaceous; venter piceous, becoming metallic posteriorly. Legs, including coxæ, completely yellow. Halteres yellow. Wings lutescent, veins yellow. Length, 6 mm.

*Female:* Front and vertex green, their sides parallel, medially bisected by a fine impressed line, which also separates the transversely lunate frontal white spots. Between the antennæ and the frontal marks the ground colour is piceous. Otherwise as in the male.

Described from two males and one female collected by the writer at Austin, Texas, one bearing the date of April 28, 1900.

Although not a typical *Sargus*, this species is placed in this genus, as it is closely related to *elegans*, Loew. From *elegans* it may be distinguished by the shorter contiguity of the male eyes (in *elegans* the eyes are contiguous up to the ocellar triangle), by the lack of frontal spots in the male, the wholly green thorax and the black pleura.

PTECTICUS.

The two species occurring in the United States may be separated as follows:

Front black above; hind metatarsi black, remainder of hind tarsi white..... .....*Sackenii*, Williston.
Front wholly yellow; hind tarsi brown.....*trivittatus*, Say.

*P. trivittatus*, Say. (*P. similis*, Will.).

A single female from Pennsylvania.

HERMETIA.

1. *H. illucens*, Linn.

Not rare at Austin, Texas, during the whole year. The species seems to have a predilection for fences and sidewalks, where they can be picked up with the fingers, showing no desire for flight.

2. *H. aurata*, Bellardi.

Austin, Texas. April-May.

OXYCERA.

1. *O. maculata*, Oliv.

Opelousas, La. (May-June); Toronto, Ontario.

2. *O. unifasciata*, Loew.

Boykins, Va. (June); McHenry, Ill.

EUPARYPHUS.

*E. tetraspilus*, Loew.

McHenry, Ill. June.

NEMOTELUS.

The genus *Nemotelus* has been reviewed in the current number of Psyche, where five new species are described from my collection.

MYXOSARGUS.

*M. fasciatus*, Brauer.

Several specimens, all males, of this dainty little species were taken running about on the large leaves of Elephant's-ear growing along the Comal River, New Braunfels, Texas. May.

STRATIOMYIA.

Owing to the absence in Florida of Mr. C. W. Johnson at the time of publication, the analytical keys of *Odontomyia* and *Stratiomyia* in the Trans. Am. Ent. Soc. (1895) are full of typographical errors. Every student of this paper has been perplexed as to the meaning of the strange mélange. The following table is a transcription of the key published on page 230 of Mr. Johnson's paper:

Head ♂ ♀ narrower than the thorax.....2.
Head ♂ ♀ much wider than the thorax; third antennal joint flat ....17.
2. Eyes ♂ ♀ glabrous.....3.
Eyes ♂ pubescent.....16.
3. Occiput of both sexes largely yellow.....4.
Occiput black, sometimes yellow beneath.....8.
4. Antennæ normally long.....5.
Antennæ noticeably shorter than in the other species.....7.

5. Abdominal spots usually connected on the fourth segment of the male, and always connected on the fourth and usually on the third of the female ..... 6.
Abdominal spots never connected on the fourth segment of the ♂, and rarely connected in the ♀ ..... *barbata*, Loew.

6. Fifth segment with a large keystone-shaped marking. *melanostoma*, Lw.
Fifth segment with a dorsal line and spot at the anterior angle ..... *lativentris*, Lw.

7. Abdomen: lateral triangular markings on the second and third segments, widely connected on the lateral margin... *Bruneri*, Johns.
Abdomen: lateral subtriangular markings on the second and third segments not connected at the lateral margins ..... *laticeps*, Lw.

8. Scutellum normally yellow, or with base narrowly black..... 9.
Scutellum black, or with narrow apical margin yellow..... 12.

9. Second segment with lateral triangles; wings infumated ..... 10.
Second segment with narrow lateral markings; wings usually dark ..... *senaria*, Lw.

10. Posterior margin of fourth segment yellow, with median triangular projection..... *unilimbata*, Lw.
Yellow on posterior margin of fourth segment interrupted..... 11.

11. Fourth segment with a small dorsal triangle; vertex of ♀ black..... *normula*, Lw.
Fourth and fifth segments with small dorsal triangles; vertex of ♀ usually yellow..... *norma*, Wied.

12. Abdomen with yellow markings..... 13.
Abdomen wholly black ♂ (♀ unknown)..... *Nevadæ*, Big.

13. Abdominal markings linear..... 14.
Abdominal markings coalesced, forming a triangular yellow spot at the anterior corners of the abdomen ..... 15.

14. Fifth segment with a dorsal line; lateral markings on the segments of the ♀ very narrow..... *Meigenii*, Wied.
Fifth segment with a dorsal triangle; lateral markings on the segments of the ♂ ♀ prominent ..... *apicula*, Lw.

15. Pile of the thorax unusually long and dense; abdomen wide, third and fourth segments very convex..... *discalis*, Lw.
Pile on the thorax normal; abdomen narrow, and third and fourth segments noticeably convex ..... *quaternaria*, Lw.

16. Face of ♀ yellow, ♂ black; abdomen with a wide maculated or indented lateral margin; variable.....*maculosa*, Lw.
Face of ♂ ♀ yellow, with a longitudinal line of black; abdominal markings transverse, the same in both sexes; eyes of ♀ glabrous.....*badius*, Walker.

17. Abdomen: bands on the second segment interrupted, the third and fourth contiguous.....18.
Abdomen: fourth and fifth segments only with wide yellow bands.....*mutabilis*, Fabr.

18. Scutellum ♂ black.....19.
Scutellum ♂ ♀ yellow.....*constans*, Lw.

19. Abdomen: bands on the second and third segments contiguous.....*Gerstæcheri*, Bell.
Abdomen: second segment with two large spots...*bimaculata*, Bell.

List of species of *Stratiomyia* studied.

1. *S. melanostoma*, Lw.
McHenry, Ill. July.

2. *S. lativentris*, Loew.
Chicago, Ill. (July); Canada.

3. *S. normula*, Loew.
Chicago, Ill. (May); Colorado.

4. *S. norma*, Wiedemann.
Indiana; McHenry, Ill. (June).

5. *S. unilimbata*, Loew.
McHenry, Ill. (July); Milwaukee, Wisc. (June); Berkeley, Col. (May).

6. *S. Meigenii*, Wiedemann.
Chicago, Ill.; Austin, Texas; S. Dakota.

7. *S. apicula*, Loew.
Algonquin, Ill. (June); Austin, Texas (April).

8. *S. discalis*, Loew.
Chicago, Ill. May.

9. *S. badius*, Walker.
McHenry, Ill. June and July.

10. *S. constans*, Loew.
Austin, Texas. April to October. Common.

## ODONTOMYIA.

The puzzling key to the species of *Odontomyia*, given in the Transactions of the American Entomological Society, 1895, pp. 250–251, was printed without Mr. Johnson's supervision, and contains numerous mistakes in typography. The student attempting to use the key is misled to a blind ending in four places. The dichotomy is given corrected herewith. In addition to the species listed by Mr. Johnson, the Supplement of the Biologia Centrali-Americana contains three recent species from Mexico.

Third longitudinal vein branched ..... 2.
Third longitudinal vein simple ..... 13.

2. Abdomen largely green or yellow ..... 3.
   Abdomen largely black, the markings comparatively narrow ..... 10.
3. Sides of dorsulûm of thorax yellow or green ..... 4.
   Dorsum of thorax wholly black ..... 8.
4. Abdominal markings ♂ ♀ dissimilar; markings of ♂ confluent laterally ..... 5.
   Abdominal markings ♂ ♀ similar, separated ..... 7.
5. Disc of thorax usually with two irregular marks ..... *binotata*, Lw.
   Disc of thorax without marks ..... 6.
6. Spines of scutellum blunt ..... *varipes*, Lw.
   Spines of scutellum sharp ..... *viridis*, Bell.
7. Abdominal markings triangular, attenuated and reaching the lateral margins ..... *cincta*, Oliv.
   Abdominal markings triangular, not reaching the lateral margins ..... *dorsalis*, Fabr.
8. Abdomen ♀ with transverse bands; ♂ with only lateral markings at posterior angles ..... *inæqualis*, Lw.
   Abdomen ♀ with transverse bands; male with dorsal line ..... 9.
   Abdomen ♂ ♀ similar, with basal triangular spot and transverse bands ..... *rufipes*, Lw.
9. Scutellum and spines yellow ..... *arcuata*, Lw.
   Scutellum and spines black ..... *flava*, Say.
10. Scutellum more or less yellowish, without spines ..... 11.
    Scutellum black, with spines ..... 12.
11. Scutellum wholly black; black of the vertex does not extend over the vertical angle ..... *fallax*, Johns.
    Scutellum, base black; black of the vertex extends over the vertical angle: proboscis longer ..... *nigrirostris*, Lw.

12. Wings: very dark brown, face produced ..... *nigerrima*, Lw.
Wings: veins reddish, face rounded, front broad ..... *pilosus*, Day.
13. First antennal joint less than twice the length of the second ..... 14.
First antennal joint twice the length of the third or longer ..... 24.
14. Scutellum largely yellowish ..... 15.
Scutellum black or marked with yellow ..... 18.
15. Pleura ♂ yellow; thorax ♀ with yellow vittæ ..... *trivittata*, Say.
Pleura ♂ black; thorax ♀ not vittate ..... 16.
16. Abdomen wholly green ..... *Aldrichii*, Johns.
Abdomen with black marks ..... 17.
17. Antennæ, front and vertex red ..... *hydroleonoides*, Johns.
Antennæ, front and vertex black ..... *vertebrata*, Say.
18. Scutellum laterally green ..... *Texasiana*, Johns.
Scutellum apically green ..... 19.
19. Abdomen ♂ ♀ with wide dorsal line, usually narrower in ♂ than in ♀ ..... 20.
Abdomen ♀ black with transverse markings, ♂ with dorsal line ..... *interrupta*, Oliv.
Abdomen ♂ ♀ with transverse or triangular markings ..... 23.
20. Third antennal joint sharply pointed; front yellow ..... 21.
Third antennal joint bluntly pointed; front shining black ..... 22.
21. Abdomen brown-black, with wide continuous lateral margin; scutellum ♀ yellow ..... *microstoma*, Lw.
Abdomen with irregular median black stripe ..... *pilimana*, Lw.
22. Pile of thorax whitish; median black stripe of abdomen straight ..... *Americana*, Day.
Pile of thorax yellow; median black stripe notched on the sides ..... *virgo*, Wied.
23. Femora yellow; abdominal marks usually triangular ..... *pubescens*, Day.
Femora black; abdominal marks transverse ..... *hoodiana*, Big.
24. First and second joints of the antennæ black ..... 25.
First and second joints red ..... 26.
25. Front and vertex wide, lateral thoracic stripe continuous ..... *hieroglyphica*, Oliv.
Front and vertex narrow; lateral thoracic stripe abbreviated anteriorly ..... *similis*, Johns.
26. Eyes pubescent; scutellum of ♀ yellow ..... 27.
Eyes glabrous; scutellum black, with yellow margin ..... *occipitalis*, Johns.
27. Abdomen ♂ broad, with narrow markings, pilose ..... *obscura*, Oliv.
Abdomen ♂ narrow, with wide markings, pubescent ..... *flavicornis*, Oliv.

(To be continued.)

## BOOK NOTICES.

THE MOTH BOOK.—A popular guide to a knowledge of the Moths of North America. By W. J. Holland, D.D., Director of the Carnegie Museum, Pittsburg, Pa., etc. New York : Doubleday, Page & Company, 34 Union Square ; 4to. pp. xxiv. + 479. (Price $4.00 net, postage 34 cents.)

It is now four years since Dr. Holland published his admirable "Butterfly Book," and for some time the possessors of it have been looking forward eagerly to the publication of this companion volume, which is intended to afford an easy introduction to the identification of our moths. We can well understand that the task has been a difficult one, as there are six thousand species listed, a number manifestly impossible to figure or describe in a single volume, and the problem has been how to make a satisfactory selection from this vast number. The author has wisely solved the difficulty by figuring almost all the larger and more conspicuous species which the ordinary collector is most likely to meet with, and giving representatives of many genera in the remaining families. Owing to the limitations of space, no descriptions are given as a rule, but there is a useful key to the families, and a list of books which the student may consult.

The forty-eight plates, containing over 1,500 figures, are very beautiful, and for the most part true to nature, but in some cases the purple tint of the background affects the correctness of the colouring. In many instances the effect is marvellously successful, as may be seen in the case of *Composia fidelissima* (plate xxxviii., fig. 4), and the figures of larvæ on the frontispiece. The cuts in the text, 263 in number, are not so satisfactory, owing to the rough texture of the paper, which has prevented clear impressions from being made.

A full meed of gratitude is certainly due to Dr. Holland for this welcome addition to the goodly list of popular works on Natural History. With this volume, the Butterfly Book, and Dr. Howard's Insect Book, the way is made easy for beginners in the study of Entomology, who should now become many times more numerous than ever before. The initial difficulties regarding the identification of specimens being largely removed, collectors and students should have much more time at their disposal for tracing out the life-histories and observing the manners and customs of insects respecting which we know little at present.

The want of a "Beetle Book" still remains unfulfilled. Its preparation would be an even more difficult task than that of the "Moth Book," owing to the immense number of species to be dealt with, and the minute size of a large proportion of them; it might, however, be practicable to take up a certain number of families at a time and spread the work over two or more volumes.—C. J. S. B.

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We have before us Dr. Holland's long expected "Moth Book," a companion to his well-known "Butterfly Book," published in the same style and only a little larger. The coloured plates show most characteristically the appearance of all the commoner North American moths, except in the lower families, where only typical illustrations are given. The book will be of great value to all collectors. Not only this, but there are several features wherein it will commend itself to more advanced students. Several types are figured, noticeably some of Hulst in the Geometridæ, and among these I see some species with the appearance of which I was not hitherto familiar. A few new species are described by Dr. Holland, and there is some change in the nomenclature, notably the adoption of the names of the Sphingidæ proposed by Rothschild and Jordan. There is no attempt at description of genera or species, and the synoptic tables do not proceed beyond family definition; but a good review of the literature of the subject is given, arranged under a heading of families. We are personally aware that Dr. Holland took much pains to avoid misidentification of his figures, but are sorry to note that a considerable number have nevertheless crept in. A casual glance over the plates shows, for example, pl. xxix., fig. 66, what purports to be *Cydosia majuscula*, Hy. Edw., but really represents *Tricostibas calligera*, Zell. Pl. xlii., fig. 32, is labelled *Tephroclystis absinthiata*, Cl., but shows *Macaria infimata*, Guen.; pl. xliii., figs. 10 and 11, are marked *Hydriomene custodiata*, Guen., but really represent *Hydriomene excurvata*, Grt. On page 378 in the text is figured "*Inguromorpha basalis*," which should be *Cossula magnifica*, while the cut on page 379, which purports to be the latter species, is a representation of something unfamiliar to me, which is neither *magnifica* nor *basalis*. The plate xlvii., representing Limacodiæ, contains several errors: fig. 15 should be *Euclea indeterminata*, not *E. chloris;* fig. 21 should be *Tortricidia flexuosa*, not *Cochlidion y-inversa*, and fig. 27 should be *Cochlidion latomia*, not *C. rectilinea*, which has black hind wings. We fear that there are other such misidentifications, and on this point the student will have to be on his guard in using the book. HARRISON G. DYAR.

CATALOGUE OF THE LEPIDOPTERA PHALÆNÆ IN THE BRITISH MUSEUM, Vol iv. By Sir George F. Hampson, Bart. London: 1903; xx + 689 pages, with a supplementary volume of coloured plates.

With this volume the Noctuidæ are begun, the classification to be used is outlined, and about one-tenth of the species are treated. Fifteen subfamilies are recognized, based on the usual structural characters, but used in a new order, and a very commendable one it seems to us. The first subfamily, the one treated in this volume, is the Agrotinæ, containing all those Noctuids with trifid venation of the hind wings and spines on the hind tibiæ. This subfamily is remarkably well represented in North America, so that the volume consists largely of our familiar names—I ought to say our familiar species, for the names are very largely changed. The sequence of genera, too, is a new one. The little day-flying *Heliolonche modicella* heads our list, followed by the Heliothids and Schinias, and finally the bulk of the Agrotids proper. These changes in the generic names were fully to be expected, since now for the first time all the old names are applied to the world fauna. Besides this, secondary sexual characters are not used in generic definition, and this naturally makes a great change in the names as heretofore applied by American authors. We have been in the habit of using these characters very largely. I am therefore pleased to note that there are some of our names that are not changed. I regret that Hübner's "Tentamen" is not adopted. American economic students will hardly recognize the familiar Boll-worm under the new appellation of *Chloridea obscura*, Fab. A part of this change could have been avoided by recognizing the Tentamen; it would have allowed the retention of the generic name *Heliothis*. Our large genus *Carneades (Paragrotis*, Pratt, of Bull. 52, U. S. Nat. Mus.), made still larger by the addition of *Rhizagrotis* and *Corhizagrotis*, is called *Euxoa*, Hübn. It would be *Agrotis* if the Tentamen names were applied. The term *Noctua*, Linn., does not appear in the volume, being applied to the South American species *strix*. The process of arriving at this and other types of genera is not elucidated, and it is not clear to us. We can only hope that future workers will not feel obliged to review the matter, and change all the names again.

A few new genera are based on our species, and two new North American species are described. Most ill-advisedly, the name *Californica* has been selected for one of these. This specific name has been used

already too often, so that it has become a nuisance to anyone attempting to use a specific index. There are thirty species named *Californica*, and including the variants *Californiæ*, *Californiata*, *Californiella*, *Californiana* and *Californicalis*, the name has been used forty-eight times. The other new name, *borealis*, is also objectionable, having been used no less than sixteen times for North American species.

We note that Harvey's species are uniformly credited to Harris.

At the end of the book is a list of 77 unrecognized species, 26 of which are North American, and might have been eliminated from the list if American students had exerted themselves more actively to assist the author. HARRISON G. DYAR.

## PERSONAL NOTES.

From *Science* we learn that the following Entomological appointments have been recently made:

MR. S. I. KUWANA, M. S. (Leland-Stanford University), has been appointed Entomologist at the Central Agricultural Experimental Station, Nishigahara, Tokyo, Japan. His special studies have been devoted to scale insects, and he has monographed the Japanese Coccidæ, so far as the species are at present known.

PROF. C. P. GILLETTE, Entomologist at the Agricultural College, Fort Collins, Colorado, has been appointed Chief Entomologist of the St. Louis Exposition.

MR. H. MAXWELL-LEFROY, who left Barbadoes early in the year to fill the the position of Entomologist to the Government of India at the Imperial School of Forestry, Dehra Dun, N. W. Provinces, is to be stationed at Surat in the Bombay Presidency.

PROF. W. M. SCOTT, State Entomologist and Pathologist of Georgia, has been appointed Pathologist in the Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C.

PROF. WILMON NEWELL, of the Texas Agricultural College, has been appointed State Entomologist of Georgia, *vice* Prof. Scott.

Mailed January 4th, 1904.

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# The Canadian Entomologist

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EDITED BY

REV. C. J. S. BETHUNE,

LONDON, ONTARIO.

JUNE, 1904.

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1904.

# EXCHANGE.

*Subscribers are invited to make liberal use of this column. Notices over three lines are liable to be shortened if necessary. All insertions free to subscribers.*

---

EUROPEAN COLEOPTERA.—I have a large quantity of European Coleoptera which I wish to exchange for American. Lists furnished. PAUL J. ROELOFS, 90 Rue van Straelen, Antwerp, Belgium.

COLEOPTERA.—I offer Henshaw's Nos. 18, 25f, 129, 231, 234, 650, 1320, 1469, 1679, 1813, 2151, 2579, 2693, 2741, 2929, 3586a, 4014, 4161, 4427, 6011, 6240, 6488, 6814, 7007, 7667, 8581, 9093, 9166, etc., etc. Please send lists to JOS. C. OUELLET, C. S. V., Ville St. Louis, Montreal, Can.

WANTED, FOR CASH OR EXCHANGE.—Fitch's 4th Report on Insects of N. Y.; Smith's Reports on N. J. Insects for 1889 and 1902; Bulletins 9 and 33 (old series), Parts IV. and VI. Bibliography of Ec. Ent., Div. of Ent., U. S. Dept. of Agr.; 15th, 16th, 18th and 19th Reports on Illinois Insects. W. E. BRITTON, Agr. Exp. Station, New Haven.

TORTRICIDÆ, TINEIDÆ and PYRALIDÆ.—I will identify specimens in these subfamilies, from all N. Am. localities, for privilege of examination and records. Gen. and Sp. names to Dyar's new catalogue. Will also exchange. W. D. KEARFOTT, 114 Liberty St., New York, N. Y.

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ORTHOPTERA.—Determined Colorado species to exchange for species not represented in the College collection here. C. P. GILLETTE, Ft. Collins, Colorado.

WANTED in South and Western U. S., correspondents who will collect Cicindela in exchange for named Coleoptera of Mexico, Central and South America, Europe and Australia. Write at once. ZOOLOGICAL MUSEUM, 37 Zool. Bldg., University of Chicago, Chicago.

LEPIDOPTERA.—450 Cynthia, 50 Polyphemus and 50 Cecropia cocoons to exchange for Lepidoptera of Boreal America. FERDINAND GOEBEN, 464 Atlantic Ave., Brooklyn, N. Y.

WILL COLLECT Hymenoptera, Diptera and Neuroptera of Oregon during season of 1904, in exchange for Lepidoptera of the world. EDWIN V. LANSING, JR., Salem, Ore.

WANTED.—Lepidoptera of Canada, in papers with data, in exchange for British Lepidoptera, in papers with data, during the coming season. Acidalidæ and Plusiidæ especially desired. RALEIGH S. SMALLMAN, Carlton House, Herne Hill, London, S. E. England.

WANTED.—Material for the study of the hybrid or polymorphic butterflies of the genus *Basilarchia*, including larvæ or pupæ of *arthemis* or *astyanax*, imagoes of *proserpina* or *arthechippus*, or any specimens showing unusual characters. Liberal exchange. Specimens retained will be deposited in Museum of Comparative Zoology. W. L. W. FIELD, Milton, Mass.

MOTHS OF PENNSYLVANIA AND NEW JERSEY.—The undersigned will give good exchange, in cash or specimens, for moths of Pennsylvania and New Jersey that are new to his collection. Send list of rare species only. PHILIP LAURENT, 31 East Mt. Airy Ave., Philadelphia, Pa.

WANTED.—Various species and varieties of the genus Eubaphe (Crocota). Other Lepidoptera also desired, especially mounted specimens. Send lists to A. KWIAT, 701 Larrabee St., Chicago, Ill.

The Canadian Entomologist.

VOL. XXXVI. LONDON, JULY, 1904. No. 7

# THE CRICKETS OF ONTARIO.

BY E. M. WALKER, B. A., M. B., TORONTO.

(Continued from page 144.)

## Subfamily GRYLLINÆ.

This subfamily includes the common field and ground crickets, and is represented in Ontario by two genera, *Nemobius* and *Gryllus*. These may be separated as follows:

a. Small species; last joint of maxillary palpi twice as long as the one preceding; hind tibiæ furnished with long movable spines; first joint of hind tarsi unarmed above, or with one row of small teeth ..... *Nemobius.*

aa. Medium-sized or large species; last joint of maxillary palpi but little, if any, longer than the one preceding; hind tibiæ armed with short immovable spines: first joint of hind tarsi sulcate above, with a row of teeth on each side ..... *Gryllus.*

## Genus NEMOBIUS.

This genus is best known by the common little striped ground cricket *(N. fasciatus)*, which abounds in our fields and roadsides in late summer and autumn. Our other species are all much more local and less numerous in individuals, and are not likely to be taken by the collector unless he is specially looking for them.

### Key to Ontario species of Nemobius.

a. Ovipositor as long as or barely shorter than the hind femora, straight or nearly so.

b. Ovipositor distinctly longer than hind femora, black of body arranged in lengthwise bars.

c. Ovipositor a fourth longer than hind femora, colour light grayish, with distinct black markings; size medium or rather small ..... 1. *N. griseus*, n. sp.

cc. Ovipositor not more than about an eighth longer than hind femora, size large.

d. Colour blackish or fuscous; the dark stripes on occiput always visible, though sometimes indistinct in very dark specimens ....2. *N. fasciatus.*

dd. Colour light reddish-brown or grayish; without dark stripes on occiput .....3. *N. canus.*

bb. Ovipositor no longer than hind femora; black of body scattered in blotches and dashes .....4. *N. maculatus.*

aa. Ovipositor distinctly shorter than hind femora, usually more or less arcuate.

e. Small species; tegmina of male covering about three-fourths of the abdomen, last two joints of maxillary palpi in female dark brown .....5. *N. palustris.*

ee. Medium-sized species; tegmina of males reaching tip of abdomen, last two joints of maxillary palpi in female light brown .....6. *N. angusticollis*, n. sp.

3. NEMOBIUS GRISEUS, new species.

Size rather small, body moderately slender, light yellowish gray, covered with fine short closely-appressed gray hairs. Head about as wide as the pronotum, rather large, full and rounded; below the antennæ deep shining piceous, elsewhere yellowish gray, the occiput with three distinct dark gray longitudinal bands. Eyes of average size, about as prominent as in *N. fasciatus*, but rounder than in that species. Maxillary palpi dark reddish-brown, the third joint and the apex and base, respectively, of the second and fourth lighter. A dark piceous band starts behind the eye and covers the lateral lobe of the pronotum, except the extreme lower margin, which is light yellowish. Pronotum nearly three-fourths as long as broad, widening slightly posteriorly, dorsum pale yellowish-gray, sparsely covered with black bristles. Tegmina of ♂ usually covering about three-fourths of the abdomen, and fitting closely to the latter, pale yellowish, with the upper half or more of the lateral field shining black, a black streak along the dorsal field near the inner margin, and usually two or three smaller black patches near the base. Tegmina of ♀ usually covering about one-half the abdomen, the hind margin less convex than in *fasciatus*, pale testaceous, a shining black stripe along the upper third of the lateral field, a black streak on the dorsal field between its outer and middle thirds, and a few short streaks and spots on the inner two-thirds. Wings absent or fully developed, and extending beyond the tips of the hind femora by more than one-half their length. Abdomen in ♂ glossy black

on dorsal and lateral surfaces, grayish-yellow beneath; in ♀ with the dorsal surfaces of the first three segments shining black, elsewhere yellowish-gray, with a row of dark spots along the dorsum. Hind femora dark sooty brown above, with a few small light spots along dorsal surface, the dark colour extending down irregularly over about half or more of the inner and outer surfaces, where it is more or less broken into blotches; elsewhere pale testaceous, lighter internally. Legs dark sooty brown, variegated with pale testaceous. Ovipositor about as long as the body, and about one-fourth longer than the hind femora, nearly straight, stout, the apical blades tapering evenly to a fine point, the teeth sharp, prominent, and nearly equidistant.

Length of body, ♂ 7 mm., ♀ 8 mm.; pronotum, ♂ 1.5 mm, ♀ 1.75 mm.; tegmen, ♂ 3.5 mm., ♀ 2.9 mm.; hind femur, ♂ 5 mm., ♀ 6 mm.; ovipositor; 7.7 mm.

12 ♂♂, 13 ♀♀. Toronto, Aug. 16, Sept. 8, 1902; Sarnia, Aug. 16, 1901; De Grassi Pt., Lake Simcoe, Aug. 3, 1903; Sept. 15, 1901. I have a single long-winged female, taken at High Park, Toronto, Aug. 16, 1902.

This is a well-marked species, easily distinguished from *N. fasciatus* by its much smaller size, grayish coloration, more distinct dark markings and longer ovipositor. It has the longest ovipositor of any of our species.

It occurs only on sandy soil, where the vegetation is somewhat scanty. I have never taken it in large numbers, but in High Park, where all my Toronto specimens were taken, it is by no means scarce when looked for in the proper kind of locality. Its pale colours renders it very inconspicuous against the sand.

The chirp of the male is a feeble, continuous trill, more high-pitched than that of *fasciatus* or *angusticollis*, and much shorter than either.

4. NEMOBIUS FASCIATUS, De Geer. The Striped Ground Cricket.

*Gryllus fasciatus*, De G., Mem. pour serv. à l'hist. des ins., III., 1773, 552.

*Nemobius fasciatus*, Scudd., Mat. Mon. N. A. Orth., VII., 1862, 430.

*Acheta vittata*, Harr., Ins. Inj. Veg., 1862, 152.

*Nemobius vittatus*, Scudd., Mat. Mon. N. A. Orth., VII., 1862, 430.

*Nemobius fasciatus vittatus*, Beut., Bull. Amer. Mus. Nat. Hist., VI., 1894, 267.

*Nemobius exiguus*, Scudd., Mat. Mon. N. A. Orth., VII., 1862, 429.

Length of body, ♂ 9 mm., ♀ 10 mm.; pronotum, ♂ 1.5 mm., ♀ 2 mm.; tegmen, ♂ 5.5 mm., ♀, 4 mm.; hind femur, ♂ 6.3 mm., ♀ 7 mm.; ovipositor, 9 mm.

I have found this cricket in abundance in all parts of Ontario where I have made collections of Orthoptera. In this species the tegmina usually cover about three-quarters of the abdomen in the ♂, and about half the abdomen in the ♀, and in such specimens the wings are absent. This is the form that was formerly known as *vittatus*. Specimens with wings extending far beyond the end of the abdomen are often met with, however, and are most often seen at night, when they are attracted to light. These long-winged individuals are usually, but not always, females. Blatchley says of this species in Indiana: "During hundreds of days spent in field collecting, not a single specimen of the long-winged form was taken until Aug. 1, 1902, when it was found in numbers on the stems of long grass in a marsh bordering Round Lake, Whitley County." This has not been my experience, as I have frequently come across it in the field. On Aug. 26, 1901, I found large numbers of this form floating on Lake Huron, about a quarter of a mile from the south shore of the Bruce Peninsula. It was a hot, still day, and many other insects were seen floating in the same manner, notably two other Gryllidæ, the tree cricket, *Œcanthus fasciatus*, and the long-winged form of *Gryllus abbreviatus* This species reaches maturity towards the latter part of July, and continues until severe frost, usually in the early part of November.

Specimens from the south-west appear to average larger than those from the north. My largest ones are from Arner, Essex Co., close to the shore of Lake Erie.

Localities: Niagara Falls, Point Pelee, Arner, Chatham, Sarnia, Goderich, Southampton, Bruce Peninsula, Owen Sound, Hamilton, Toronto, Lake Simcoe, Severn River, Lake Muskoka, Algonquin Park, North Bay, Stony Lake (Peterboro' Co.).

Mr. Blatchley has called my attention to a small dark *Nemobius* which he has taken in Northern Indiana, Michigan, and in Ontario across from Buffalo, N. Y. I have also taken this form, and I agree with Mr. Blatchley in considering it to be a small degenerate form of *fasciatus*.

5. NEMOBIUS CANUS, Scudd.

*N. canus*, Scudd., Journ. N. Y. Ent. Soc., IV., 1896, 100, 103.

I have a single ♀ *Nemobius* taken at Arner, Ont., which agrees pretty well with Blatchley's description of *canus*. The head is light

reddish-brown, without any trace of the fuscous stripes which are so constant a feature in *fasciatus*. The general coloration is light reddish-brown, with the dark markings more distinct than in *fasciatus*. The eyes are more globose than is usual in that species. It may be only an atypical specimen of *fasciatus*, but it appears to show the chief peculiarities by which *canus* is known from the latter.

6. NEMOBIUS MACULATUS, Blatchley.

*N. maculatus*, Bl., Psyche, IX., 1900, 52.

On Aug. 22, 1903, when collecting near Tobermory, on the Bruce Peninsula, I found a small *Nemobius* in considerable numbers jumping about in a small patch of moss in the spruce woods. I captured 4 ♂ ♂ and 3 ♀ ♀, and on my return to Toronto sent a pair to Mr. Scudder, who named them *N. maculatus*. They do not agree with Blatchley's description in all respects, and I do not feel satisfied that they really belong to that species. The ovipositor in *maculatus* is equal to or very slightly shorter than the hind femora, whereas in my specimens it is slightly longer in one and distinctly longer in the other two. The tegmina are shorter than the average in *N. fasciatus*, but are longer than those of typical *maculatus*, according to the description. They agree with the latter in having fine cross veinlets in the ♂ tegmina. The coloration does not show the spotty pattern of *maculatus* in any marked degree.

Length of body, ♂ 8 mm., ♀ 8 mm.; pronotum, ♂ 1.5 mm., ♀ 1.6 mm; tegmen, ♂ 3.5 mm., ♀ 2.75 mm.; hind femur, ♂ 5 mm., ♀ 5.3 mm.; ovipositor, 6.5 mm.

7. NEMOBIUS PALUSTRIS, Blatchley. The Marsh Ground Cricket.

*N. palustris*, Bl., Psyche, IX., 1900, 53.

Length of body, ♂ 5.5 mm., ♀ 6 mm.; pronotum, ♂ ♀ 1 mm.; tegmen, ♂ 2.7 mm., ♀ 2 mm.; hind femur, ♂ 3.5 mm., ♀ 4 mm.; ovipositor, 3 mm.

On the 18th of August, 1903, I came across this handsome little cricket in a sphagnum swamp on the margin of Ragged Lake, Algonquin Park. The swamp bordered the lake for a few hundred yards about the mouth of a small creek, and was of a very interesting character. It was carpeted throughout with a deep growth of sphagnum moss, in which cranberries *(Oxycoccus macrocarpus)* were growing in the greatest profusion. Pitcher-plants *(Sarracenia purpurea)*, various Ericaceæ, such as *Andromeda polifolia* and *Chamædaphne calyculata*, were also conspicuous among the plants, the only trees being a few dwarf specimens of black

spruce and tamarack. For about a hundred yards beyond the margin of the creek the swamp was a true floating bog, and the trees very few and small; and it was here that the crickets were found. They were present in considerable numbers, but were very difficult to capture, and when alarmed would at once burrow down among the masses of sphagnum. By pressing these masses down under water, it was often possible to bring the crickets to the surface.

Mr. Blatchley, to whom I sent a pair, remarks that the specimens are smaller than typical ones from Indiana. They are much the smallest of the Ontario *Nemobii.*

My attention was first called to this species by its chirp, which is a continuous and rather feeble trill, very like that of *N. angusticollis.*

8. NEMOBIUS ANGUSTICOLLIS. New species.

*N. palustris*, Walk., Ann. Rep. Ent. Soc. Ont., 1901, 109.

Size medium, body of male very broad. Head small but prominent, dark shining brown, more or less obscurely trifasciate above with darker brown, rather scantily covered with black bristles. Eyes small but prominent, oval. Maxillary palpi light brown, the terminal joint infuscated apically. Pronotum nearly smooth, somewhat shining dark piceous, more or less faintly variegated with lighter brown, sparsely covered with black bristles; slightly narrower at the anterior margin than the head, about equal to it in width at the hind margin; a rather deeply impressed median longitudinal line on the anterior half. Tegmina of ♂ reaching tip of abdomen, very broad, the dorsal breadth being much greater than that of the pronotum, but fitting pretty closely to the abdomen; uniform deep shining piceous. Tegmina of ♀ covering about two-thirds of the abdomen. Wings absent or fully developed, and extending beyond the tips of the cerci. Legs and abdomen fuscous, the former more or less variegated with pale testaceous, the hind femora without bands upon the inner surface. Ovipositor a little more than one-half as long as the hind femora, slightly arcuate, and feebly expanded at the base of the apical fourth, each blade bearing an irregular row of rather sharp teeth, the basal ones fine and close together, the apical coarse and unusually far apart.

Length of body, ♂ 8 mm., ♀ 8.5 mm.; pronotum, ♂ 1.5 mm., ♀ 1.6 mm., tegmen, ♂ 5.4. mm., ♀ 3.4 mm.; hind femur, ♂ 4.5 mm., ♀ 5 mm.; ovipositor, 3.3 mm.

This species is most related to *N. confusus* and *N. palustris*, and also resembles *N. exiguus* in some respects. It differs from all three in

the smaller head and narrower pronotum, the width of which, in *angusticollis*, is less than the dorsal field of the tegmina in their natural position. It differs from *palustris* in the much greater size, the longer and broader tegmina in the male, lighter maxillary palpi and shorter ovipositor, with more irregular teeth. From *confusus* the male of *angusticollis* differs in the longer and broader tegmina, those of *confusus* covering only three-fourths of the abdomen, and in the uniform coloration of the hind femora, those of *confusus* being blotched and spotted on the inner surface. The females of *angusticollis* approach those of *confusus* so closely that they are separated with difficulty. The last two joints of the maxillary palpi in the latter are white, those of the former light brown; the hind femora and ovipositor are somewhat shorter in *confusus*, while the pronotum as mentioned before is broader than in *angusticollis*. From *exiguus*, *angusticollis* differs in the much darker and more uniform coloration, the much broader body and tegmina in the male, narrower hind femora, and in the somewhat longer and more sharply-toothed ovipositor.

Although neither has been reported from Ontario, I have figured both *exiguus* and *confusus* from specimens kindly loaned me by Mr. Blatchley, because it is thought that this will aid in the separation of these difficult species, and it is quite possible that both, especially *exiguus*, will eventually be found to occur in Ontario. *Angusticollis* is, next to *fasciatus*, the commonest *Nemobius* in Ontario. It frequents low grounds of almost any kind, but delights especially in low grassy borders of swampy woods or clearings in swamps. I have found it in abundance in sphagnum moss when growing in such localities, but have not met with it in the open peat-bogs where *N. palustris* occurs. It is also found beneath stones along the margins of lakes and streams.

I first discovered this insect through its stridulation, which I heard among the granite boulders which line the shores of Lake Simcoe at De Grassi Pt. It was a high-pitched continuous trill of considerable volume, and although I could approach the performer within a few feet, it was always necessary to disturb the rock in order to expose him. This, of course, not only silenced him, but allowed him to make himself scarce, and it was not until after repeated efforts that I at last secured one of the little musicians.

Of the long-winged form I have but a single pair, a male taken at De Grassi Pt., July 30, 1901, and a female from the Severn River, Aug. 24, 1898.

This species reaches maturity about the last week of July, and continues till November.

Localities: Toronto, Sept.-Nov.; Lake Simcoe, July 29–Sept. 14; Sarnia, Aug. 15, 1901; Southampton, Aug. 20, 1901; Owen Sound, Aug. 31, 1901; Severn River, Aug. 24, 1898.

(To be continued.)

EXPLANATION OF PLATE 4.

1. *Nemobius griseus*, nov. sp., ♂.
2. " " " " ♀.
3. " *fasciatus vittatus* (De G.), Harr., ♀.
4. " *maculatus* (?), Blatch., ♀.
5. " *exiguus*, Blatch., ♂.
6. " " ♀.
7. " *confusus*, Blatch., ♂.
8. " " ♀.
9. " *angusticollis*, nov. sp., ♂.
10. " " " ♀.
11. " *palustris*,, Blatch., ♂.
12. " " ♀.

All the figures are magnified two and one half diameters.

## THE REVEREND P. JEROME SCHMITT.

We regret to chronicle the death of the Rev. P. Jerome Schmitt at St. Vincent's College, near Beatty, Pa., on April 27th. Father Schmitt was well known to the entomological world as a most careful and able worker, generous with his specimens and his time. He will be sadly missed by those who had the privilege of his acquaintance.

Father Schmitt was born at Neuhausen, Wurtemberg, May 30, 1857; he came to St. Vincent's College in 1869, and in 1876 joined the Benedictine Order. In 1881 he was ordained priest of the Roman Catholic Church, and spent the greater part of the remaining years of his life in teaching the classics at the College. He found time for a great deal of close work with the Coleoptera, and was especially devoted to the study of some of the minute Clavicornia, as will be seen by reference to the writings of present-day authors. At the time of his seizure by the disease which resulted in his death, he was engaged on a descriptive catalogue of the Pselaphidæ collected in Brazil by H. H. Smith.

His collections and manuscripts remain at the College where his life was spent, and the material collected by him will no doubt be carefully preserved by his confreres. It has formed the basis of numerous records in Dr. Hamilton's Catalogue of the Coleoptera of Western Pennsylvania, and has furnished types of many new species described during the past ten years.—H. F. W.

## SYNOPSIS OF BEES OF OREGON, WASHINGTON, BRITISH COLUMBIA AND VANCOUVER.—III.

BY H. L. VIERECK, ASSISTED BY T. D. A. COCKERELL, E. S. G. TITUS, J. C. CRAWFORD, JR., AND M. H. SWENK.

### ANDRENA, Fabr., and OPANDRENA, Robt.

#### Females.

Third joint of antennæ equal to 4 + 5, or very nearly ..... 1.
Third joint of antennæ longer than 4 + 5 ..... 4.

1. Scopa ample, compact, the hairs long and curved up ..... 2.
   Scopa with the hairs short and straight ..... 3.
2. Abdomen punctured; dorsulum closely indistinctly punctured, not metallic; enclosure very finely rugulose, almost smooth ..... *viburnella*.
   Abdomen not punctured.
   Without distinct narrow fasciæ.
   Fovea about as broad as one-half the distance between lateral ocellus and eye margin.
   Enclosure granular, very nearly rugulose; abdomen black ..... *melanochroa*.
   Enclosure very finely granulated, abdomen greenish ..... *chlorogaster*.
   With distinct narrow fasciæ.
   Dorsulum impunctate or with indistinct punctures; abdomen black; dorsulum dull.
   Second abdominal segment with a broad whitish testaceous margin at apex ..... *Illinoiensis*.
   Abdominal segments not broadly testaceous; green or greenish or blue.
   Enclosure nearly smooth; abdomen greenish ..... *Piperi*.
   Enclosure rugulose; abdomen distinctly green .. *chlorinella*.
   Abdomen distinctly blue ..... *candida*.
3. Metatarsus of posterior legs one-half as wide as the tibiæ at apex; enclosure smooth; abdomen indistinctly fasciate .. *angustitarsata*.
   Metatarsus of posterior legs more than one-half as wide as the tibiæ at apex.
   Abdomen fasciate; clypeus indistinctly punctured, dull.
   Enclosure smooth; pubescence abundant on the clypeus; pubescence of dorsulum gray ..... *mustelicolor*.
   Enclosure smooth; pubescence sparse on the clypeus ... *subtilis*

4. Abdominal segments depressed nearly to the base..*trachandrenoides.*
Abdominal segments not unusually depressed.
Abdomen distinctly punctured.....5.
Abdomen not distinctly punctured.....8.

5. Enclosure coarsely rugose, at least at base; dorsulum with very distinct punctures; superior surface of metathorax rather convex..6.
Enclosure not coarsely rugose; nearly smooth.....7.

6. Abdomen shining; hair of dorsulum and face white or pale ochreous.
Abdomen black.
Pubescence white.....*Kincaidii.*
Pubescence yellow.....*Kincaidii* var.
Abdomen red, at least partly.....*Kincaidii*, var. *Pascoensis.*
Abdomen dull; hair of dorsulum and face bright fulvous....*Vernoni.*

7. Punctures of abdomen sharply defined; posterior tibiæ dark; enclosure rather rugose.....*Cressoni.*

8. Abdomen fasciate, with rather dense appressed hair bands.....24.
Abdomen usually without dense appressed hair bands, where they occur they are not broad, and the abdomen is tessellate punctate.....9.

9. Abdomen with more or less abundant erect pale hair.....20.
Abdomen with no conspicuous erect pale hair.....10.

10. Abdomen and scopa with pale pubescence.....11.
Abdomen and scopa with black or very dark pubescence.....17.
Abdomen with black pubescence; scopa with pale pubescence...16.

11. Abdomen very distinctly punctate tessellate.....12.
Abdomen not distinctly punctate tessellate.....13.

12. Clypeus finely punctured, almost granular.....*pulverulenta.*

13. Length over 11 mm.....14.
Length less than 11 mm.....15.

14. Dorsulum impunctate.....*seminigra.*

15. Abdomen with lateral patches of silvery appressed pubescence.....*subaustralis.*

16. Pubescence of dorsulum black.....*indotata.*

17. Enclosure smoother, only partly rugose.
Abdomen tessellate punctate.....18.
Abdomen not punctured.....19.

18. Punctures of abdomen dense.
    Face with black hairs; first recurrent nervure received before the middle of the second submarginal cell; dorsulum with reddish pubescence ..... *Halli.*
    Face with ochreous hairs; first recurrent nurvure received beyond the middle of the second submarginal cell; pleura with pale pubescence ..... *solidula.*
    Face with ochreous hairs; first recurrent nervure received before the middle of the second submarginal cell; pleura with pale pubescence ..... *junonia.*
    Face with pale to dark brown hairs; pleura with pale pubescence ..... *compactiscopa.*
  Punctures of abdomen not dense.
    Pubescence of dorsulum ochreous.
      Pleura pale ..... *vicina.*
      Pleura black.
        Abdomen black.
          Dorsulum entirely pale.
            Face with pale pubescence; first recurrent nervure received before the middle of the second submarginal cell ..... *Carlini.*
            Face with black pubescence; first recurrent nervure received beyond the middle of the second submarginal cell.
              Enclosure smooth ..... *neurona.*
              Enclosure partly rugose ..... *pluvialis.*
          Dorsulum with a black band ..... *transnigra.*
        Abdomen blue ..... *Seattlensis.*
19. Clypeus sparsely punctured, especially in the middle.
    Clypeus deeply punctured.
      Abdomen blue, with a greenish cast ..... *Chapmanæ.*
      Abdomen greenish and purplish ..... *Chapmanæ* race.
      Abdomen black.
        Scopa very compact ..... *Pullmani.*
        Scopa loose ..... *longihirtiscopa.*
  Clypeus not deeply punctured ..... *vicinoides.*

20. Scopal hairs long and curved ..... 21.
Scopal hairs short and straight ..... 22.
Abdomen covered with pale hairs except at apex..... ..... 23.
Abdomen only partly covered with pale hairs.
First abdominal segment with pale hairs.
Posterior legs black or nearly..... *saccata.*
First and second abdominal segments with some pale hairs; scopa pale.
Clypeus rather sparsely punctured, especially in the middle ..... *hemileuca.*
Clypeus rather densely punctured ..... *clypeoporaria.*

22. Scopa thinly pubescent..... *advarians.*
Scopa densely pubescent..... *Washingtoni.*

23. Clypeal punctures fine and dense.
Nearly all scopal hairs white.
Pubescence on abdomen abundant; anal fimbria white, tinted with brown..... ..... *moesta.*
Only the lower half of the scopa with pale or white hairs ..... *albihirta=perarmata.*
Clypeal punctures large and sparse.
Dorsulum with sparse pubescence; first two segments of abdomen no more pubescent than the remaining segments ..... *Harveyi.*
Dorsulum with abundant pubescence; first two segments of abdomen distinctly more pubescent than the remaining segments ..... *asmi.*

24. Fovea about one-half as wide as the distance between the eye and lateral ocellus ..... 26.
Fovea distinctly broader than one-half the distance between the eye and lateral ocellus.
Process of labrum ordinary, truncate or rounded..... 25.
Process of labrum various, as long as broad at base, quadrate, finger-shaped, emarginate or pointed..... 27.

25. Clypeus with a distinct median impunctate space or the punctures sparse.
A clearly defined median impunctate space on the clypeus..... ..... *medionitens.*
No clearly defined median impunctate space on the clypeus..... ..... *semipolita.*

Clypeus closely punctured.
Dorsulum with pale pubescence.
Abdomen greenish, purplish or bluish.
First recurrent nervure received by the second submarginal cell before the middle ; anal fimbria bright brown ..... *xanthostigma.*
First recurrent nervure received by the second submarginal cell beyond the middle ; anal fimbria sooty.
Abdomen dull ; stigma pale ..... *candida.*
Abdomen rather shining; stigma dark ..... *subcandida.*
Abdomen black.
First recurrent nervure received by the second submarginal cell before the middle ; abdomen thinly subfasciate ..... *decussata.*
First recurrent nervure received by the second submarginal cell beyond the middle; abdomen not fasciate. *decussatula.*
Abdomen fasciate ; dorsulum dull, apparently impunctate ; clypeus not hidden by pubescence ; abdomen greenish ..... *subdistans.*

26. Enclosure not rugose.
Clypeus dull impunctate ..... *plana.*
Clypeus dullish, dense, with indistinct punctures ..... *auricoma.*
Clypeus rather closely punctured, but not densely ..... *scurra.*

27. Process of labrum finger-shaped ; scopa compact .... *Macguillivrayi.*
Process emarginate, but not deeply.
Posterior legs pale ..... *nubilipennis.*
Posterior legs dark ; abdomen fasciate ; anal fimbria dark brown ..... *W-scripta.*

ANDRENA.

Males.

Cheeks produced into a rounded angle ..... 1.
Cheeks regularly rounded, not angulate ..... 10.

1. The angle opposite or below the middle of the eye ..... 2.
The angle above the middle of the eye ..... 7.

2. Angle opposite the middle of the eye ..... 3.
Angle below the middle of the eye ..... 6.

3. Joint 3 shorter than 4 ..... *hemileuca.*
Joint 3 longer than 4, but shorter than 4 + 5 ..... 4.
Joint 3 about equal to 4 + 5 ..... 5.

4. Abdomen with black pubescence. ..... ..*solidula*.
   Abdomen with pale pubescence.
   Fasciæ absent..... .....*decussata*.
5. Pubescence on face and thorax partly black.....*Harveyi*.
6. Pubescence white.....*viburnella*.
   Pubescence ochreous..... .....*viburnella* var.
7. Mandibles armed with a tooth at base.....8.
   Mandibles not armed with a tooth at base.....9.
8. Pubescence of abdomen pale and black; joint 3 much longer than 4, but not as long as 4 + 5 .....*advarians*.
   Pubescence of abdomen pale.
   Pubescence fulvous; joint 3 = 4 or nearly .....*asmi*.
   Pubescence white; joint 3 much longer than 4, but not as long as 4 + 5.....*perarmata*.
9. Abdomen black.
   Pubescence white .....*subaustralis*.
   Pubescence ochreous to fulvous .....*subaustralis* var.
10. Joint 3 about = to 4..... .....11.
    Joint 3 distinctly longer than 4, but shorter than 4 + 5 .....13.
11. First recurrent nervure received by the second submarginal cell before the middle ..... .....12.
    First recurrent nervure received by the second submarginal cell beyond the middle; abdomen blue.....*candida*.
12. Dorsulum punctured (species not determined).....
    Dorsulum impunctate.....*angustifovea*.
13. First recurrent nervure received by the second submarginal cell before the middle.....14.
    First recurrent nervure received by the second submarginal cell in or beyond the middle.....17.
14. Abdomen punctured ..... .....15.
    Abdomen impunctured .....16.
15. Metathorax smooth ..... ..... *W-scripta*.
16. Enclosure granular.
    Pubescence dense; antennæ pale in front.....*Illinoiensis*.
    Pubescence thin; antennæ black in front.....*melanochroa*.
    Enclosure indistinctly striated.
    Stigma dark brown; pubescence of dorsulum fulvous..*medionitens*.
    Stigma pale; pubescence of dorsulum pale ochreous...*microsoma*.

17. Abdomen fasciate or subfasciate.....18.
Abdomen not at all fasciate .....24.
18. Abdomen densely clothed with ochreous pubescence.....*trachandrenoides.*
Abdomen not densely clothed with ochreous pubescence.....19.
19. Legs pale, wings yellow.....*auricoma.*
Legs dark, wings not yellow, pale .....20.
20. Dorsulum shining .....*scurra.*
Dorsulum dull .....21.
21. Abdomen blue .....*Seattlensis.*
Abdomen black.....22.
22. Pubescence bright fulvous .....*Washingtoni.*
23. Large 10 mm.; fasciæ rather distinct.....*Macguillivrayi.*
Smaller 8 mm.; fasciæ rather indistinct .....*Pullmani.*
24. Abdomen with some black pubescence.....25.
Abdomen with no black pubescence .....26.
25. Face and legs with black hair .....*Carlini.*
Face and legs with pale hair.....*saccata.*
26. Cheeks not twice as broad as the eye .....*vicina.*
Cheeks twice as broad as the eye.....*pulverulenta.*

OPANDRENA and PTERANDRENA.

Males.

Joint 3 longer than 4, shorter than 4 + 5.
Abdomen more or less distinctly punctured.....1.
Abdomen impunctate.....4.
1. Tibiæ pale .....2.
Tibiæ dark.....3.
2. Abdomen shining; indistinctly fasciate; pubescence whitish..*Kincaidii.*
pubescence fulvous..*Kincaidii* var.
Abdomen dull, distinctly fasciate .....*Vernoni.*
3. Abdomen rather indistinctly punctured; scutellum polished..*Trevoris.*
Abdomen distinctly punctured; scutellum dull .....*Cressoni.*
4. Dull; distinctly fasciate.....*mustelicolor.*
Joint 3 longer than 4 + 5; abdomen shining subfasciate ....*pallidifovea.*

*Andrena viburnella*, Graen. CAN. ENT., XXXV., 1903, p. 165.

♀, 6th, 7th June, 1899, Corvallis, Or. (Cordley); ♂, 27th April, 1895, Almota, Wash. (C. V. Piper); 17th April, 1896, Livingston, Vanc.; Victoria, B. C. This may be the same as *A. perplexa*, Sm.

*Andrena melanochroa*, Ckll. Ent., Lond., 1898, p. 89.,

♀, 25th May, 1894, Olympia, Wash.; ♂, 15th May, 1894, Olympia, Wash. (T. Kincaid); ♀, 18th May, 1896, Livingston, Vanc. (2119).

*Andrena chlorogaster*, n. sp.

♀ 6 mm. A small, almost entirely impunctate species, with pale hairs in the fovea, pale pubescence and dark brown stigma.

Type locality: Oregon. Type Am. Ent. Soc., Phila.

*Andrena Illinoiensis*, Robt., Trans. Am. Ent. Soc., Phila., XVIII., p. 54.

♀, 16th April, 1897; ♂, April, 1895, Pullman, Wash. (C. V. Piper).

*Andrena Piperi*, n. sp.

♀ 7 mm. Dull black, finely sculptured, impunctate, covered with white pubescence, stigma pale brown.

Type locality: Pullman, Washington. Type Univ. of Nebraska.

*Andrena chlorinella*, n. sp.

♀ 8 mm. Pubescence white; fovea nearly black; dorsulum purplish and greenish; abdomen blue and greenish; anal fimbria nearly black.

Type locality: Corvallis, Oregon. Type Acad. Nat. Sci., Phila.

20th May, 1899, at the type locality (Cordley).

*Andrena candida*, Sm. New Spec. Hym. Brit. Mus., p. 55.

♀, 18th June, 1895, Olympia, Wash. (T. Kincaid); ♂, 18th June, 1895, Olympia, Wash. (T. Kincaid); April, Pullman, Wash. (R. W. Doane), Vancouver (Sm.).

*Andrena angustitarsata*, n. sp.

♀ 9 mm. Pubescence ochreous; fovea ochreous. This is a stylopized specimen, and may be an aborted *A. subtilis*, the abortion due to the presence of the stylops.

Type locality: Washington. Type Am. Ent. Soc., Phila.

*Andrena mustelicolor*, n. sp.

♀ 9 mm. Pubescence mouse gray; anal fimbria and fovea brownish.

Type locality: Pullman, Washington. Type Univ. Nebraska.

♀, Pullman, Wash. (C. V. Piper); ♂, 9th May, 1899, Corvallis, Or. (Cordley).

*Andrena subtilis*, Sm. New Spec. Hym. Brit. Mus., p. 55.

♀, July, 1898; 4th May, 1898; 7th May, 1899; 8th June, Corvallis, Or. (Cordley); ♂, Pullman, Wash. (C. V. Piper); Vancouver (Sm.).

(To be continued.)

## NEW SPECIES OF NORTH AMERICAN LEPIDOPTERA.

BY WILLIAM BARNES, S. B., M. D., DECATUR, ILL.

(Continued from page 173.)

*Mamestra elsinora*, n. sp.—Expanse: 37 mm.

General colour very dark blackish brown, with a slight purplish tinge, quite smooth and somewhat shiny. Ordinary markings jet black, but not conspicuous, owing to the similarity in shade with the ground colour. The distinct black, more or less solidly filled claviform and the yellow-filled reniform are the most conspicuous features in the maculation. Basal line present though fragmentary, represented by two blackish dots on costa, in one specimen with some whitish scales between them, forming a more or less evident dot, in the other specimen this is not so noticeable, the line is also evident between the median and submedian veins, though in a lighter, diffused sort of way. Just above the median vein is a small yellow point, quite distinct in one specimen, faint in the other. T. a. line transverse, more or less outwardly scalloped between veins, in a few places, especially on the costa, showing as a double line, with a somewhat paler filling. The outer line is the more easily traced, but even this is not very distinct without a lens. A narrow median shade can be made out running from costa downward and outward to lower edge of reniform, thence to inner margin very close to termination of t. a. line. T. p. line only moderately exserted over cell, thence parallel to outer margin in a quite direct line to inner margin, inwardly scalloped between veins. An outer accompanying line is only indicated here and there by a few scales and a tendency to a lighter filling between the two is evident though very faintly marked. S. t. line fragmentary, wavy, showing a mixture of black and yellow scales, with the naked eye the yellow can be traced as a faint fragmentary line across the wing and the black as two closely approximate sagittal dashes opposite cell, extending almost to reniform and usually one smaller one just below costa. With the lens these sagittal marks can be traced more or less plainly across the wing, and the yellow scales seem to be imbedded in them. There are fine yellow points at the termination of veins, which have a tendency to extend outward, more or less completely through fringe, giving it a faintly checkered appearance. Fringe concolorous, with a very faint, wavy, lighter mesial line. Orbicular moderate in size, narrowly black ringed, within which the lens shows indications of a fine yellowish line.

Reniform moderate in size, erect, surrounded by a black line, which is, however, somewhat broken and of uneven width, outwardly broadly yellow-filled, inwardly to a lesser degree, this yellow colour in one specimen largely fills the spot, in the other it is broken and fragmentary. Claviform conspicuous, black-filled, crosses t. a. line, and in some instances its lower fork almost, if not quite, reaches basal line. Hind wings with a broad blackish fuscous outer border, inwardly much lighter. Discal dot well marked. Mesial band faint, lighter, hard to follow from its being merged in fuscous border. Fringe, outer portion whitish, inner half fuscous, with pale wavy yellowish-white line at base.

Beneath: fore wings dark fuscous, more or less mixed with gray along costa and outer margin. Mesial line evident, though not prominent. Discal dot present. Hind wings dark grayish fuscous along costa and external margins, paler centrally. Well-marked mesial band and discal dot. Head, collar and thorax slightly darker than wings. Abdomen fuscous, paler at base. One or two dorsal tufts at base, though not prominent. Palpi blackish outwardly, lighter inwardly. Tongue yellowish, at root of tongue on either side, when seen with lens, a small tuft of bright orange hair. Thorax, abdomen and legs dark smoky fuscous. Eyes hairy. Antennæ broadly bipectinate, pectinations terminating in one or two fine ciliæ. Antennæ light yellowish fuscous.

Types: 2 ♀'s, Huachuca Mts., Ariz.

*Mamestra hueco*, n. sp.—Expanse: 35 mm.

General colour a light yellowish brown or tan with darker coloured or purplish brown markings, relieved by whitish shades, especially in the median space. Palpi yellowish at tip, reddish outwardly. Head yellowish. Collar tan-coloured, yellowish at base, tipped with whitish. Patagia purplish-tan, somewhat darker than collar, bordered and tipped with whitish. Thorax tan, moderate posterior thoracical tuft. Abdomen tan and purple shades, latter most pronounced at the posterior part and former at the anterior part of the segment, anal tuft distinct and well marked. Abdomen at sides, below the middle, densely coated with tan-coloured hairs, having a tendency to arrange themselves in tufts. Fore wings, basal half line distinct, purplish, in the centre just above median veins a prominent broad, solid tooth of the same colour projects almost to the t. a. line, there is also a small tooth above and below the median one. The lower one of these is almost or quite connected with a

similar inwardly-projecting tooth on the t. a. line by a band of the same colour. The basal line is bordered inwardly by a well-marked reddish band, which extends beyond it to the submedian vein, thence outward as an accompanying shade. T. a. line distinct, purplish-brown, transverse. Two inwardly-projecting teeth just above and below the median vein, forming a well-marked W, as above mentioned they show a tendency to connect with the basal line, the lower part of the line forms a single broad scallop to inner margin, there is an accompanying whitish shade on the outer side, and at inner margin a slight indication of an accompanying purplish line. T. p. line distinct, vinous, somewhat irregular in width, exserted over cell in a somewhat quadrangular manner, thence to inner margin in a couple of broad waves. The line is peculiar in that it does not extend entirely to costa, but turns inward at quite a sharp angle and follows parallel to costa and at about ½ mm. removed from it, as a narrow purplish line as far as outer edge of orbicular. The line itself, as well as the prolongation, is bordered within with a lighter diffuse whitish shade. At inner margin the line is accompanied on its inner side for a short distance by an accompanying line. The veins through the median space are very delicately and lightly tinted with purplish and also accompanied by whitish shades. The median shade is diffuse, scarcely, if at all, to be traced except from inner margin to lower edge of reniform. S. t. line pale yellowish, scalloped, bordered within and without with purplish, on the outside this purplish border projects along veins as sharp teeth to terminal line. The veins in the subterminal space and especially in the centre of the wing are quite heavily coated with purplish shades, which almost, if not quite, join in many places, connecting the purple shades of the t. a. and s. t. lines. There is a purplish terminal line composed of shallow lunules, these are accompanied inwardly by a pale yellowish shade, which gradually darkens as it approaches the s. t. line. Fringes pale at base, purplish outwardly, cut with paler at termination of veins, in some specimens there is an extremely faint median lighter line. Pale yellowish spots on costa at inceptions of basal and t. a. lines, one over cell and three similar dots on apex. Orbicular quite large, subquadrate, quite evenly tan-coloured, bordered outwardly with pale, within which is purplish ring, varying in width, in general much broader in the superior half. Reniform large, slightly oblique, constricted in centre, purplish and light ring the same as orbicular, centre somewhat paler. In one specimen before me

there is, at the inner upper edge of reniform, a small purplish dot, surrounded by the prolongation of the yellowish border, a corresponding dot of similar size is at the outer upper edge of the orbicular. In other specimens these spots are fused with the purple rings of the ordinary spots, forming slight projections on them, in some specimens they are separate on one side, united on the other. Claviform is present, distinct, though not prominent, lighter tan-coloured outlined in pale yellow. Hind wings pale yellowish, semitranslucent, slightly darker outwardly and along veins.

Beneath: fore wings yellowish, paler than above, longitudinally streaked with purplish in middle of wing, from base to end of cell, some purplish streaks at base. Hind wings pale yellowish-white, slightly purplish along costa and at upper angle. Two or three purplish spots along veins towards costa, the only indication of a mesial band. On primaries the purplish shades terminate rather abruptly and are here somewhat thickened along the veins, giving a rather faint resemblance to mesial band. Discal spots only apparent as a few faint dark scales, under lens, not apparent to the naked eye. Abdomen below rusty tan colour, more or less mixed with purplish. Legs banded yellowish and purple.

Types: ♂ and ♀, Huachuca Mts., Ariz.

*Admetovis similaris*, n. sp.—We have received at various times a number of specimens of an insect showing on superficial examination so much similarity to *oxymorus*, Grt., that we have without further investigation placed them together. We find both forms likewise in the National Museum and Henry Edwards's collections, and, if we remember correctly, also in that of Mr. Neumoegen. Both forms seem to occur in the same locality, as we have examples of each from Arizona and S. California. *Oxymorus* we also have from Colorado. Grote's figure (Bull. Buff. Soc., Vol. I., p. 133, Pl. iv., fig. 5) leaves no doubt as to which form he had before him when he made his description, and for the other, of which we now have six specimens before us, evenly divided as to sex, we propose the name *similaris*. The most obvious distinguishing feature lies in the secondaries, which in the new variety are semi-translucent, white with a faint yellowish tinge, and show none of the yellowish brown scales which almost, or quite, cover the wing in *oxymorus*. A few faint dots in two of the females suggest a mesial line, and a very faint discoloration in one female towards anal angle and

a slight darkening of some of the veins, especially in the female, are all that mars the otherwise uniform clearness of the wings. In *oxymorus* the darker portions of the fore wings are frosted with white, more or less obscuring the markings and giving a powdery appearance to the wings. In *similaris* these portions are smooth, even, dark iron-gray, neater and cleaner looking, not so "mussed up." The basal and t. a. lines are fine, black and more distinct than in the older species. No trace of claviform, except in one specimen, and that very faint, while in *oxymorus* it is quite marked. The t. p. line is exserted further beyond cell and on inner margin comes closer to the t. a. line. The upper of the two dark patches beyond s. t. line is more triangular, and the lower extends farther in towards t. p. line.

Types: 3 ♂'s, 3 ♀'s. So. California, March and May; Arizona, April and May.

*Tæniocampa alamosa*, n. sp.—Expanse: 34 mm.

Ground colour yellowish-brown or sepia, markings darker shades of the same colour, with a vinous or purplish cast. Ordinary lines double distinct, pale-filled, basal half line well marked crenulated, outer portion emphasized just above median vein by a small, rather broad toothed projection, surrounded by the same shade as the filling. T. a. line transverse, irregular, cut by the somewhat lighter veins, outer portion heavier than inner. Median shade well marked, passes almost directly across wing from inner margin to costa, between reniform and orbicular, it is also cut by the lighter veins and slightly lunulated between them, especially in lower half. T. p. line well-defined, moderately exserted over cell and slightly incurved below it, consists of a series of lunules between veins, the lunular character being more marked opposite cell. S. t. line distinct, pale yellowish-tan, wavy, emphasized by a preceding rather purple shade, which is made up of lunules between the veins, the line being almost or quite cut by them. The terminal space has a row of terminal lunules projecting between them, both being of a purplish colour. These purplish lunules are continued through the fringe, which otherwise is of a lighter colour. Orbicular moderate in size, subquadrate, slightly inwardly oblique, pale-ringed, purplish-filled, somewhat lighter centrally. Reniform of good size, erect, moderately constricted, pale-ringed, purplish-filled, somewhat lighter centrally. Hind wings yellowish-white, slightly darker along extreme edge. Veins somewhat darker, fringe concolorous.

Beneath: fore wings pale yellowish, somewhat darker centrally, quite uniform double outer line well-marked on costa towards apex, fading out below. Veins, especially towards apex and outer margin, somewhat covered with purplish scales. Some ochre-coloured hairs at base of wing and inner margin. The central portion of wing is also thinly-covered with moderately long white hairs. Hind wings pale yellowish, costal edge and veins somewhat darkened. Palpi yellowish inside, mixed with purple outside. Head, collar and thorax mottled tan and purplish, arranged on collar in alternate bands. The scales at front of thorax, just behind collar, are of a more ochraceous tint. Abdomen pale yellowish, slightly darker than secondaries. Beneath: legs yellowish internally, purplish and tan externally.

Type: ♂ and ♀, Huachuca Mts., Ariz.

*Tricholita chipeta*, n. sp.—♂ 32 mm., ♀ 35 mm.

In many collections will be found specimens of a species of *Tricholita* from Colorado, under the name of *fistula*, Harv., most of these came from either Mr. Bruce or myself. At the time these were distributed I had no specimens of Harvey's species from California, from which locality the types originally came, and so had no reason to doubt the correctness of the identification. Having recently, however, received specimens from California which agree much more nearly with Harvey's description, I feel certain they are the true *fistula*, and that we have in the Colorado specimens a distinct species. There is no question but that the two species I have before me are perfectly distinct. In a series of eight specimens from Colorado, evenly divided as to sex, the following variations from the Californian ones are constant: The arrangement of the white spots in the form of a pipe (mentioned by Harvey) is very clear in the Californian specimens, in the Colorado ones the upright row of spots is more rigid, not so curved, and the inner spot corresponding to the bowl of the pipe is in all the specimens prolonged inwardly as a sharp spur varying in length, in some specimens reaching as far as the inner edge of the orbicular, it is bordered above and below by a more or less distinct black line. The claviform is plainly marked, neatly outlined in black in all Colorado specimens, while no trace of it can be seen in the others. The orbicular is drawn out in a longitudinal direction, and in some specimens is continued quite a distance inwards towards the base, in other specimens there is a single black line running inwards from orbicular. In

some specimens the cell is considerably darkened, in others very slightly so. The secondaries are whitish, dusky along margins in male, in the female dusky throughout, though somewhat lighter at base. Fringe dusky at base, white externally. Beneath *fistula* is much darker and has a well-marked mesial line on both wings, of which there is no trace in the Colorado form.

As a whole they are quite different looking insects, aside from the difference in markings, and, if I am correct in the identification of Harvey's species, there can be no doubt but that the Colorado ones are new.

Types: Glenwood Springs, Colo.

*Cucullia agua*, n. sp.— ♂ expanse, 44 mm.; ♀, 46 mm.

General type of maculation recalling *convexipennis*, ground colour a rather clear bluish gray, with a faint reddish-brown flush, markings in brown varying in shade from light reddish through dark umber to almost black. Transverse lines almost obsolete. Extreme base of wing dark umber brown, with a small white spot next to costa. Inner margin with narrow dark brown, almost black, line. A prominent dash above inner angle of same colour, interrupted at its inner fourth by a pale lunule. A small blackish spot below costa, just before orbicular, and a larger, more diffuse one between reniform and orbicular from costa to median vein. The latter is continued as a faint shade obliquely to inner angle. The wing between this band and base is a rather clear gray, only very faintly tinged with reddish brown; beyond the band and above the median vein the wing is a light brown, slightly darker outwardly and above, the costa being, however, narrowly gray, with two or three pale dots and one or two outwardly oblique short black dashes. Beyond the band below median vein the wing is gray but considerably washed with brown, especially outwardly. The veins, especially the median and its branches, are darkened. Orbicular small round, brown, with faint interrupted blackish limiting line. Reniform moderate in size, upright, kidney-shaped, limiting line dark umber brown, outwardly more blackish, inwardly fragmentary. The spot is not conspicuous, being concolorous with the brown subapical shade which embraces it. The t. a. line is almost obsolete, but on very close inspection it can be made out. It makes a wide, outwardly projecting

tooth below median vein. There is a dark brown interrupted terminal line. Fringe concolorous with adjacent portion of wing, paler at base. Hind wings soiled white, shading into fuscous outwardly, veins darkened, fringe white.

Beneath fore wings smoky, paler on inner half of inner margin, costa somewhat more gray. Quite a coating of long hairs on wing below costa over cell. Secondaries soiled white, darker outwardly and along costa. Palpi blackish outwardly, pale brown within. Head dark, black and gray mixed. Collar pale brown, largely mixed with gray, in front and through middle antero-posteriorly dark brown, almost black. A darker brown mesial band, narrowly edged with white anteriorly. Patagia gray, more or less edged with black. Abdomen fuscous. Fan-shaped dorsal tuft at base and two or three more rounded ones behind it, dark blackish gray. Thorax and abdomen beneath pale yellowish brown. Legs yellowish brown inwardly, more or less gray outwardly, tarsi darker brown.

♀ resembles ♂ closely, but fore wings are more obscured with dark blackish brown; the oblique median shade being much darker. Ordinary spots more constrasting and have dark brown centres. Hind wings darker, basal area more obscured.

Types: 1 ♂, 1 ♀. Huachuca Mts., Ariz. One specimen from Mr. Poling, the other of my own collecting.

(To be continued.)

## A SYNTOMID FAR AWAY FROM HOME.

I have on several occasions had specimens of both the European and Oriental cockroaches sent me by fruit dealers, who had found them on bunches of bananas, and there was a report of the capture of a large scorpion, said to be over five inches in length, on a bunch at Spokane, Wash., but the most interesting capture that I have to record is a beautiful freshly-emerged specimen of *Ceramidia Butleri*, Möschler, which I secured here last March. The specimen was sent to the U. S. Museum for identification, and Dr. Dyar writes me that it made a welcome addition to their cabinet, and cites Guatemala and the Amazons as its habitat.

J. Wm. Cockle, Kaslo, B. C.

## DESCRIPTIONS OF SOME NEW SPECIES OF TABANIDÆ.

BY C. P. WHITNEY, MILFORD, N. H.

*Chrysops lupus*, n. sp.— ♀.—Length, 8–9 mm. Face shining yellowish ferruginous, callosities outside of suture, and cheeks black. Antennæ black, base of first joint fulvous. Front grayish-pollinose, callosity black. Thorax black, with the usual glaucous stripes. Scutellum black. Abdomen yellow, first segment with a black spot wider anteriorly, and connecting on second segment with a subquadrate spot deeply emarginate posteriorly, which does not attain the posterior margin of the segment. The following segments have four large triangular black spots anteriorly, well separated from the posterior margins, and forming serrate bands on the fifth and sixth segments. Venter yellow, with transverse black spots increasing posteriorly. Legs black; front coxæ, middle femora and tibiæ, distal half of posterior femora, posterior tibiæ and base of tarsi ferruginous.

Wings: root, costal cell, crossband and apical spot brown; first basal cell more than one-half infuscated, second at extreme base only. The crossband reaches the posterior margin only as a brown cloud on the last section of the fifth vein. The apical spot is broad in the distal end of the first submarginal cell and occupies as a brown shade about one-third of the apical part of the second submarginal, being almost disconnected from the crossband by the hyaline triangle which crosses the second longitudinal vein.

Hab.: Grand Lake, Col. Nine females collected by Mr. G. M. Dodge in August. Long's Peak, two females, Mr. E. A. Dodge, July.

The wing picture most resembles *hilaris*, O. S., of any eastern species, though the first basal cell is farther infuscated. The abdominal markings are somewhat like *callidus*, O. S., but the spot on second segment is shaped more as on *indus*, O. S.

*Chrysops Pikei*, n. sp.— ♀. Length, .6–8 mm. Face yellow, the callosities infuscated outwardly. Antennæ slim, first joint yellow, second a little infuscated, the third blackish brown. Front yellow, with black callosity and ocellar space. Thorax black, with wide, well-defined stripes of greenish-yellow. Abdomen yellow, with two broad black median stripes the entire length, and two narrow abbreviated lateral stripes beginning on the third segment. The sixth segment is mostly black. Venter yellow, with slender furcate lateral lines and an abbreviated wider median stripe black. Legs yellow; distal part of anterior tibiæ, anterior and posterior tarsi infuscated.

July, 1904.

Wings: first basal cell completely infuscated, except a small apical hyaline spot contiguous to a basal one in the discal cell. The second basal cell is hyaline, except a slight proximal infuscation. The crossband reaches the hind margin, completely filling the fourth posterior cell. The fifth posterior cell is entirely hyaline, except for a slight but distinct cloud near the tip of the fifth vein, and which occasionally extends up the vein as a very faint shade. The hyaline triangle seldom reaches the second longitudinal vein and is broad and blunt at its extremity. The apical spot nearly fills the second submarginal cell and crosses the first posterior at its extremity.

Eleven females, collected by Mr. G. M. Dodge in Pike Co., Mo. One specimen has the front and dorsum of thorax dense black.

This species resembles *sequax*, Will., but the latter has the hyaline triangle narrower, arcuated, owing to the convex distal margin of the crossband, and it crosses the second vein.

*Tabanus benèdictus*, n. sp.— ♀. Length, 23–25 mm. Palpi slender, dark brown with appressed black hairs. Two basal joints of antennæ dark brown, third joint fulvous, the angle prominent. Eyes revived by moisture, purple, with two green bands. Front narrow, distinctly contracted anteriorly, dark brown; callus brown, twice as long as wide, with a fusiform prolongation above. Subcallus and face covered with dense yellow pollen. Thorax dark reddish-brown with a faint whitish median line. Abdomen black, pruinose. Legs black, base of tibiæ dark reddish. Wings fuliginous; base, costal cell and stigma fulvous, brown clouds upon cross-veins and divarication of third vein. First posterior cell closed or nearly so.

Five females, Mr. G. M. Dodge, Pike Co., Mo., August.

This species may be easily recognized by its peculiar abdomen, which resembles that of *atratus*, F., its narrow front and closed first posterior cell.

*Tabanus (Thevioplectes) typhus*, n. sp.— ♀. Length, 11–13 mm. Palpi yellow, long and tapering, with white and black hairs. Face and cheeks grayish, covered with white pollen and long white hairs. Antennæ fulvous; first two joints with black hairs, third joint with upper angle obtuse, the concave upper margin sometimes infuscated, the annular tip black. Eyes purple, with the green bands common to the subgenus. Front broad, whitish-gray, slightly contracted anteriorly, callus castaneous,

a darker lanceolate spot above, subcallus covered with white pollen. Thorax olive black, with three lighter lines, antealar tubercle rufous with black hairs. Abdomen rufous with a broad median black stripe broken by the white posterior margins of the segments. There are lateral rows of large, angular whitish spots with whitish hairs, resting on the posterior margins of the segments. Commencing on the second or third segment near the lateral margin are blackish spots, increasing posteriorly. The whitish margins expand medially into a row of very small triangles. Venter rufous, darker posteriorly with white margins. Legs fulvous, base of femora and tips of tibiæ infuscated, tarsi black. Wings hyaline; stigma, costal cell and base luteous.

Six females, Milford, N. H., July.

This species is the size of *astutus*, O. S., but the latter has darker antennæ, the frontal callosity black, a more perceptible cloud on the divarication of the third vein, and the median row of abdominal spots much larger. The abdomen appears more tapering and the rufous tinge is wanting.

## A NEW ICHNEUMON.

BY REV. THOMAS W. FYLES, LEVIS, QUEBEC.

*Amesolytus pictus*, n. sp.—Length of body, 8 mm.; length of antennæ, 4 mm.; expanse of wings, 13 mm.

Head: Clypeus white, pilose, somewhat mottled in appearance; mouth organs white; upper portions of the head black, except that on either side of the front there is a white line next the eye, and above the eye on either side a white semi-oval patch extending behind the ocelli. Eyes oval, large, protuberant, dark brown with a gloss. Ocelli jet black. Cheek, lower part white; upper part black. Antennæ: scape bead-like, jet black above, white beneath; pedicel jet black; flagellum 30-jointed, fuscous. Thorax: pronotum and upper parts black, set thickly with retrorse white hairs. On either side is a white line curving and widening above the first pair of legs, and then extending upward to the tegulæ. Scutellum rather small, outlined with white; upper and lower edges slightly curved; sides somewhat indented. Post-scutellum has a short white line in the middle of the outer edge. Metathorax elongate, truncated behind. Under parts of thorax light red. Fore wings: costal nervure edged with setæ, basal nervure boldly curved, first transverse cubital nervure short and straight, second ditto wanting; submedian cell larger than the

median. Hind wings: costal cell of good size, cubital cell large; the transverse cubital nervure set well back, making the median cell to end with an angle. Legs: first pair small, third pair much larger than either the first or the second; coxæ and trochanters light red; femora light red with pale yellow patches at the knees, the last pair much enlarged and curved like a bill-hook; tibiæ white, very hairy; in the second pair of legs the tibiæ have a black patch at the bottom, and in the third pair a black patch both at top and bottom; tibial spur large and white; tarsi white, hairy, the lower half of last joint and claws black. Abdomen: Attached to thorax by a short petiole slightly curving upward, clavate, 7-jointed, entirely black, punctured and pubescent.

Fig. 7.

I raised this very beautiful insect (Fig. 7, greatly enlarged) last year from *Meroptera pravella*, Grote, a leaf-crumpler on the Sumach. Dr. Ashmead says of it: "*Amesolytus*, n. sp.—Quite different from the other species described in our fauna, which comes from Texas." I have deposited a type of the species in the National Museum at Washington.

## A REVIEW OF OUR GEOMETRID CLASSIFICATION.

BY RICHARD F. PEARSALL, BROOKLYN, N. Y.

Since any work in this group must of necessity be a review of that done by the late Dr. Geo. D. Hulst, I want to state in this beginning of mine, that it is not to be regarded as a criticism.

Dr. Hulst made (for him) some curious errors, which will be noted later on, but the immense work he did in untangling the synonymy of this variable group, and in his two trips across the ocean to study the types, cannot be overestimated, and by it mine is rendered easy.

Not long since I made an attempt to rearrange my collection of Geometridæ in accordance with Dr. Hulst's classification of the group as given in Trans. Amer. Ent. Soc., Vol. 23, 1896, which was accepted as an authority, and followed without many changes by Dr. Dyar in his recent "List." Dr. Hulst divides the group into two great families, Geometrinæ and Ennominæ, based upon the development or absence of vein 5 in the

hind wings. This leads to a natural division of the specific groups, and is a good starting point. The Geometrinæ he divides into eight subfamilies. One of these, Leuculinæ, Dr. Hulst doubtfully classes as geometrid, and subsequently it proved to belong to the Liparidæ. The Brephinæ are in Dr. Dyar's "List" now placed as a subfamily at the end of the series of Ennominæ. This cannot stand, since vein 5 is developed in all specimens of Brephos I have examined, and it must go, therefore, among the Geometrinæ, or be raised to family rank, as has been done in the case of another subfamily, the Strophidiinæ, now Epiplemidæ. I understand from Dr. Dyar that the manuscript for his list was prepared by Dr. Hulst, and unless the reasons for these changes are there given, I am not aware that they are to be found.

The subfamily Dyspteridinæ is founded upon the absence of the frenulum in certain species. This division is not warranted by the studies which I have made of Dr. Hulst's collection, now lodged in Rutger's College, New Brunswick, N. J., to which, through the courtesy of Prof. John B. Smith, I was granted free access, and of the collection which he gave to the Brooklyn Institute of Arts and Sciences, as well as my own material. Examination of the types of each genus show the following results as to the presence or absence of the frenulum in both sexes :

| | Male. | Female. |
|---|---|---|
| Dyspteris..... .. | absent. | absent. |
| Cysteopteryx..... | not a valid genus. | |
| Nyctobia . ..... | present. | a tuft of stiff hairs. |
| Cladara .. ..... | absent. | absent. |
| Opheroptera ..... | present. | wings aborted. |
| Paraptera ..... | present. | " " |
| Rachela..... | present. | " " |

Such a showing should, in my opinion, eliminate this subfamily, whose affiliations are with the Hydriomeninæ, and necessitate a reorganization of the latter subfamily, which constructive work I intend to take up later on, after making a comparison of every generic type, with its description. That these descriptions contain many errors, I have already discovered. How far they may affect the general scheme of arrangement, as followed by Dr. Hulst, it is impossible to say as yet, but his arrangement of the species commends itself to me, after some study of the related forms, and it may not be necessary to greatly alter it. I sincerely hope this may be so, because I appreciate the labour bestowed upon this group by Dr. Hulst, when it was in a chaotic condition.

In this connection I may refer to a recently published query by the Rev. G. W. Taylor, concerning *Agia eborata*, Hulst., and its supplemental note by Dr. Dyar. They cite *viridata*, Packard, as the type of *Cysteopteryx*. This species was not used by Dr. Hulst as the type of *Cysteopteryx* (see Trans. Am. Ent. Soc., Vol. 23, p. 250), for *Agia eborata*, Hulst, is undoubtedly a synonym of *Lobophora viridata*, Packard, and its structural characters are widely at variance with Dr. Hulst's generic description of *Cysteopteryx*. In founding the genus *Cysteopteryx*, he gives as the type *viridata*, Grote (not Packard). I have been unable to find any description of such a species (it would probably be called a *Lobophora*), nor does it appear in the old Brooklyn Check List, or in Grote's Check List of 1882. In the Brooklyn Institute collection there is, however, a male specimen from New Hampshire, labeled *Cysteopteryx viridata*, Grote, in the handwriting of Dr. Hulst. It is a varietal form of *Nyctobia limitata*, Walk., and though the end spurs and tarsi are broken off, in the one hind leg remaining it still bears the hair pencil so curiously occurring in this group, referred to by Dr. Hulst under his detailed generic description of *Nyctobia*. It has *two* accessory cells in the fore wings, not one, and in this agrees also with *Nyctobia* as defined. In the Hulst collection at Rutger's College is a single male specimen labeled *Cysteopteryx*, which is also, in my opinion, one of the varieties of *Nyctobia limitata*, Walk., but it has the hair pencil and *one* accessory cell. Now, in my collection, seventeen specimens of the latter species divide in this respect as follows:

One accessory cell—2 males, 8 females.

Two accessory cells—5 males, 2 females.

The genus *Cysteopteryx* therefore should fall. That this showing should make it necessary to abandon the use of the accessory cell as a means to generic division, I do not admit. It only proves in this species to be a variable quantity. Nature follows no hard and fast lines. I recognize that it is no light matter thus to upset an established order of things, but facts *must* be recognized and dealt with, even if they create temporary disturbance.

NOTE.—Since writing the above, I have sent to Mr. Samuel Henshaw, Museum of Comparative Zoology, Cambridge, Mass., a specimen of *Agia eborata*, Hulst, which he has kindly compared for me with the type of *Lobophora viridata*, Packard. He writes: "Your specimen is identical with Packard's type of *Lobophora viridata*."

## A NEW GELECHIID, *TRICHOTAPHE LEVISELLA*, N. SP.

BY REV. THOMAS W. FYLES, LEVIS, QUEBEC.

The Broad-leaved Aster (*Aster macrophyllus*, L.) grows in patches of considerable size in the woods around Levis. In the month of June, 1902, I noticed that many of the large ground leaves of the plant were folded over from both sides and crinkled. On opening one of them I found that a larva had turned the leaf into a cool and pleasant tent for itself, and was feeding upon the parenchyma of the leaf.

This larva was about nine lines in length. It was of a pale green, with dorsal, subdorsal and side lines of darker green. The head and second segment were jet black and glossy. The fore part of the third segment was dull brown, on the after part of it were four conspicuous white patches. At intervals, along the subdorsal lines, and elsewhere on the body, were round jet black dots. The spiracles were black. The under side of the larva was pale green. The claspers and anal segment were marked with black.

On the 25th of the month mentioned the larva spun a capsule-like white cocoon, open at one end for the exit of the moth. Its plan was to place itself on the under side of a fresh leaf, upon the midrib; then to affix its threads at a certain distance on either side of the rib, and to draw so much of the leaf as lay between into a fold or crease. Within this it formed its cocoon.

The moths appeared on the 10th of the next month. The perfect insect when displayed measured ten and a half lines across. Its body was four lines in length, and its antennæ three lines. The palpi were dark brown, turned back usually. The basal part of them was spindle-shaped; the terminal joint was smaller, long and pointed. The fore wings were brown, clouded with darker brown towards the hind margin. They had a subterminal line of paler brown spots, bordered with black. Beyond the centre of the wings was a pale brown horseshoe-like mark, not very distinct. The secondaries were gray, with a lighter well-marked terminal line, and a gray fringe. The body was tufted at the extremity. The tarsi were ringed with white.

Professor Fernald and Mr. August Busck informed me that the moth belongs to the genus *Trichotaphe*, Clemens. I have named it *Trichotaphe Levisella*, and I have sent types of it to the U. S. National Museum.

July, 1904.

## BOOK NOTICE.

The Carnegie Museum has just issued a magnificent volume of over 300 pages, by Dr. Wm. H. Ashmead, on the Classification of the Hymenopterous Superfamily Chalcidoidea. (Classification of the Chalcid Flies of the Superfamily Chalcidoidea. Mem. Carnegie Museum, Vol. 1, No. 4, pp. 326+XII., pls. 9. Jan., 1904.)

The work is divided into two parts, the first of which includes tables for the separation of all the known genera in the group, while the second deals with the species occurring in South America.

Fourteen families of Chalcids are recognized and over six hundred genera. Many of the latter are characterized for the first time in the present work. Under each family and tribe is given a brief consideration of the affinities and general habits of the respective groups. These are of material aid to the student in identifying specimens by means of the dichotomies.

A good idea of the extreme completeness with which the work has been done may be gathered from the fact that, in the entire complex, there are only six genera which are unknown to the author and not classified.

The second part of the paper includes descriptions of nearly 200 new species of South American Chalcids and a complete synonymical catalogue of all the species from that continent, besides tables for the determination of the species in some of the larger genera.

It is to be hoped that the appearance of this work will give an impetus to the collecting and studying of this economically very important group. Dr. Ashmead may most certainly be congratulated on having done his share in placing the classification within easy attainment and giving at the same time one of the most important contributions on American Hymenoptera ever puplished.

It may also be mentioned that the volume is very nicely printed and quite free from typographical errors. The nine plates which accompany it include well-executed figures of some fifty South American genera.

C. T. B.

Mailed July 4th, 1904.

# The Canadian Entomologist

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No. 10.

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EDITED BY

REV. C. J. S. BETHUNE,

LONDON, ONTARIO.

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1904.

## EXCHANGE.

*Subscribers are invited to make liberal use of this column. Notices over three lines are liable to be shortened if necessary. All insertions free to subscribers.*

RHOPALOCERA of North America wanted in exchange, or otherwise. Correspondence desired. T. H. SHEPHERD, 15 Hope View, Carr Lane, Shipley, Yorks, England.

EUROPEAN COLEOPTERA.—I have a large quantity of European Coleoptera which I wish to exchange for American. Lists furnished. PAUL J. ROELOFS, 90 Rue van Straelen, Antwerp, Belgium.

COLEOPTERA.—I offer Henshaw's Nos. 18, 25f, 129, 231, 234, 650, 1320, 1469, 1679, 1813, 2151, 2579, 2695, 2741, 2929, 3586a, 4014, 4161, 4427, 6011, 6240, 6488, 6814, 7007, 7667, 8581, 9093, 9166, etc., etc. Please send lists to JOS. C. OUELLET, C. S. V., Ville St Louis, Montreal, Can.

WANTED, FOR CASH OR EXCHANGE.—Fitch's 4th Report on Insects of N. Y.; Smith's Reports on N. J. Insects for 1889 and 1892; Bulletins 9 and 33 (old series), Parts IV. and VI. Bibliography of Ec. Ent., Div. of Ent., U. S. Dept. of Agr.; 15th, 16th, 18th and 19th Reports on Illinois Insects. W. E. BRITTON, Agr. Exp. Station, New Haven.

TORTRICIDÆ, TINEIDÆ and PYRALIDÆ.—I will identify specimens in these subfamilies, from all N. Am. localities, for privilege of examination and records. Gen. and Sp. names to Dyar's new catalogue. Will also exchange. W. D. KEARFOTT, 114 Liberty St., New York, N. Y.

WANTED.—North American *Geometridæ*, eastern and southern species (many of the commonest). Offered: Lepidoptera, Coleoptera and Hemiptera, named, from British Columbia. GEO. W. TAYLOR, WELLINGTON, B. C.

COCOONS OR EGGS (living) wanted to purchase: Polyphemus, Cecropia, Promethea, Cynthia, Ricini, Altas, Pernyi, Yama-Mai, Mylitta, Luna, Selene, Gloveri, Ceanothi, Pyri, Trifenestrata, Sphingidæ, or Hybrids. A. L. TOURCHOT, St. Hyacinthe, P.Q.

BUTTERFLIES.—Will collect in this vicinity the coming season in exchange for named specimens, in papers or expanded, found in other localities. C. E. MONTGOMERY, 10 Cabot St., Portsmouth, N. H.

CERAMBYCIDÆ AND BUPRESTIDÆ from North and Central America wanted for cash. Write for particulars to G. CHAGNON, P. O. Box 186, Montreal, Canada.

CICINDELAS wanted (Henshaw numbers 19 to32b, inclusive). Coleoptera for exchange. Will collect in all orders. Write before sending. V. E. SHELFORD, Zoology Building, Univ. of Chicago, Chicago, Ill.

ORTHOPTERA.—Determined Colorado species to exchange for species not represented in the College collection here. C. P. GILLETTE, Ft. Collins, Colorado.

WANTED in South and Western U. S., correspondents who will collect Cicindela in exchange for named Coleoptera of Mexico, Central and South America, Europe and Australia. Write at once. ZOOLOGICAL MUSEUM, 37 Zool. Bldg., University of Chicago, Chicago.

LEPIDOPTERA.—450 Cynthia, 50 Polyphemus and 50 Cecropia cocoons to exchange for Lepidoptera of Boreal America. FERDINAND GOEBEN, 464 Atlantic Ave., Brooklyn, N. Y.

WANTED.—Lepidoptera of Canada, in papers with data, in exchange for British Lepidoptera, in papers with data, during the coming season. Acidalidæ and Plusiidæ especially desired. RALEIGH S. SMALLMAN, Wressil Lodge, Wimbledon Common, London, S. W. England.

The Canadian Entomologist.

VOL. XXXVI. LONDON, SEPTEMBER, 1904. No. 9

# THE CRICKETS OF ONTARIO.

BY E. M. WALKER, B. A., M. B., TORONTO.

(Continued from page 188.)

## Genus GRYLLUS.

This genus contains the common large black field crickets and the house cricket, which has been introduced into this country from the Old World. But three species have been taken in Ontario. All of these are dimorphic as regards wing-length, the short-winged form being the normal one in the field crickets, the long-winged form in the house cricket.

Key to the Ontario species of *Gryllus*:

a. Black species, the tegmina and parts of the body sometimes dull reddish-brown; first joint of antennæ not projecting beyond front of head. (Field crickets.)

b. Ovipositor nearly or fully half as long again as hind femora, usually exceeding 16 mm. in length; the male stout, with large and broad head.....9. *abbreviatus.*

bb. Ovipositor seldom if ever more than 14 mm. or less than 12 mm., rarely more than one-fourth as long again as hind femora; the male more slender with narrower and less swollen head .....10. *pennsylvanicus.*

aa. Straw-coloured species with some dark brown or blackish markings on head and thorax; first joint of antennæ projecting slightly beyond front of head. (House crickets).....11. *domesticus.*

9. GRYLLUS ABBREVIATUS, Serville. The Common Field Cricket.

*Gryllus abbreviatus*, Serv., Hist. Nat. des Ins., 1839, 336.

*Acheta abbreviata*, Harr., Ins. Inj. to Veg., 1862, 152.

*Gryllus luctuosus*, Serv., Hist. Nat. des Ins., 1839, 335.

*Gryllus angustus*, Scudd., Journ. Bost. Soc. Nat. Hist., VII., 1862, 427.

This is the common field cricket with which everyone is familiar. It varies greatly in size in Ontario, according to locality, southern specimens averaging much larger than northern ones. The measurements given in the published descriptions of this species are too large for average

specimens from Ontario. Specimens from Point Pelee measure about the same as those from Indiana, according to Blatchley's figures, but those from Toronto, Lake Simcoe and other places further north are distinctly smaller, the smallest average size being found in the North Bay and Northern Muskoka specimens. My smallest specimens are from Lake Simcoe, but I have many from this locality that are nearly as large as those from Point Pelee, and there is a complete series of intermediate sizes. The smaller specimens are sometimes very difficult to distinguish from *G. pennsylvanicus*, especially the males, in which the head is not always broader and more swollen than in that species. In the females the ratio of the length of the hind femora to that of the ovipositor is pretty constant.

The following are measurements of average specimens from the localities given:

| | Point Pelee. | Lake Simcoe. | Goderich. | Dwight. | North Bay. |
|---|---|---|---|---|---|
| Pronotum.... | mm.<br>♂ 4<br>♀ 4.3 | mm.<br>♂ 3.5<br>♀ 4 | mm.<br>♂ 3.5<br>♀ 3.7 | mm.<br>♀ 3.3 | mm.<br>♂ 3.3<br>♀ 3.5 |
| Hind Femur.. | mm.<br>♂ 13<br>♀ 13.5 | mm.<br>♂ 13<br>♀ 13.5 | mm.<br>♂ 11<br>♀ 11.3 | mm.<br>♀ 10.5 | mm.<br>♂ 9.7<br>♀ 10.5 |
| Body..... | mm.<br>♂ 20<br>♀ 21 | mm.<br>♂ 18<br>♀ 18.5 | mm.<br>♂ 19.5<br>♀ 18.5 | mm.<br>♀ 15 | mm.<br>♂ 16<br>♀ 17.5 |
| Ovipositor ... | 19.5 mm. | 18 mm. | 17.5 mm. | 15 mm. | 15.5 mm. |

Adults begin to appear about the second week in August. My earliest captures are from Point Pelee, Aug. 7, 1901, where I found them fairly numerous under boards and rubbish on the sand. These specimens are all of large size, the ovipositor sometimes more than 20 mm. in length. In September and October they become very numerous and congregate in large numbers under every chunk, log or board, under the loose bark of old stumps, or in burrows in the sand. Late in the season they may be seen in hundreds sunning themselves on fences close to the ground. The eggs are laid in October, and, according to McNeill, in Northern Illinois, hatch in the following July. None of the adults ever survive the winter, the crickets which appear in the spring belonging to another species.

For interesting accounts of the life-history and habits of this insect the reader is referred to McNeill's "List of the Orthoptera of Illinois," in Psyche, VI., 1891, p. 5, and to Blatchley's "Orthoptera of Indiana," p. 436.

Long-winged females of *abbreviatus* are common in Ontario, though far less so than the short-winged individuals. On Aug. 26, 1901, I found considerable numbers of them floating on Lake Huron, off the shore of the Bruce Peninsula. I have never seen a long-winged male.

Localities: Pt. Pelee, Aug. 7, 1901; Arner, Aug. 9, 1901; Rondeau, Sept. 14, 1899; Sarnia, Aug. 15, 1901; Goderich, Aug. 19, 1901; Southampton, Aug. 20, 1901; Bruce Peninsula, Aug. 25–26, 1901; Owen Sound, Aug. 31, 1901; Peterborough Co., Sept., 1903; Toronto, Aug.–Nov.; Lake Simcoe, Aug.–Oct.; Dwight, Muskoka, Aug. 23, 1903; Algonquin Park, Aug., 1902–3; North Bay, Sept. 12, 1900.

10. GRYLLUS PENNSYLVANICUS, Burmeister. The Pennsylvania Field Cricket.

*Gryllus pennsylvanicus*, Burm., Handb. der Ent., II., 1838, 734.

*Gryllus luctuosus*, McNeill, Psyche, VI., 1891, 4.

*Acheta niger*, Harr., Ins. inj. to Veg., 1862, 152.

*Gryllus neglectus*, Scudd., Journ. Bost. Soc. Nat. Hist., VII., 1862, 428.

Measurements: Length of pronotum, ♂ 3 mm., ♀ 3.3 mm.; of hind femur, ♂ 10 mm., ♀ 10.5 mm.; of body, ♂ ♀ 17.5 mm.; of ovipositor, 13.5 mm.

I have often found nymphs of this species in early spring under logs and rubbish, where they have passed the winter. The chirp of the adult is first heard about the third week in May, the last toward the end of July. They are most numerous about midsummer, when the fields and pastures resound with their song. They are very difficult to obtain, however, for they are not gregarious like *G. abbreviatus*, but usually occur in pairs hidden in the rubbish under some thick tuft of grass or weeds, or under the edge of a stone. It requires the utmost care and patience to trace the song to its source, but if this is done successfully, one is often rewarded by finding the female as well as the male.

They are found everywhere in open woods and pastures, and are most abundant on sandy soil.

Blatchley says of this species in Indiana, that "the young hatch in July and August, and after the second or third moult form their winter abiding places, while the adults perish with the coming of the hoarfrost."

It has always appeared to me that the adults disappear long before the summer is over, but this may be an error on my part. The chirping of the males becomes more and more infrequent towards the close of July, and apparently disappears before that of *abbreviatus* begins. None of my female specimens of Gryllus taken after July can be referred to *pennsylvanicus*, though some of the males, I confess, I should be unable to place were it not for their dates.

I have only one long-winged female taken at De Grassi Pt., Lake Simcoe, which has, unfortunately, no date attached.

Localities Niagara Glen, June 28, 1903; Hamilton, June, 1893; Toronto, May 23, 1898, June; Lake Simcoe, June–July 30, 1901.

11. GRYLLUS DOMESTICUS, Linnaeus. The House Cricket.

*Gryllus (Acheta) domesticus*, Linnaeus, Syst. Nat. I., 1758, 428.

*Gryllus domesticus*, Glov., Illust. N. A. Ent., 1872, Pl. VI., fig. 14.

Measurements: Length of pronotum, ♂ ♀ 3 mm.; of hind femur, ♂ 10.5 mm., ♀ 10 mm.; of body, ♂ 20 mm., ♀ 18 mm.; of ovipositor, 11 mm.

Late in the fall of 1903 I heard the chirp of a cricket in the basement of the Toronto General Hospital, but paid little heed to it, thinking it was that of a common field cricket which had entered the building. My attention was again drawn to the sound, however, as it persisted night after night, and I began to notice that it was higher pitched and of less volume than that of the field cricket. I traced the sound to the boiler-room and found, as I had expected, the European house cricket, which I had never before met with in this country. They were there in plenty, lurking in the chinks between the bricks of the wall, and positively swarmed under some loose bricks close to the furnace. They were found in all stages, most of them nearly matured. Imagoes continued to be found throughout the winter, but became scarcer in early spring, and by May had nearly disappeared.

I took one short-winged female. The rest were all long-winged.

The house cricket is said to be found also in the Trinity College building. Both this and the General Hospital are comparatively old buildings.

It has been reported once before from Toronto by Caulfield. (Ann. Rep. Ent. Soc. Ont., XVIII., 1888, 69.)

Sub-family ŒCANTHINÆ.

We have one genus, *Œcanthus*, the species of which are slender, delicate insects of pale greenish or whitish colours, living on trees, shrubs or tall herbs. The males differ considerably from the females in appearance, on account of the great width of the tegmina, which are much broader than the body, while those of the female are narrow and fit closely around the abdomen.

Only three species have been found in Ontario, but there are doubtless others in the south-western part of the Province.

Key to the Ontario species of *Œcanthus:*

a. Antennæ with but one black mark on each of the two basal joints, black marks in the form of small rounded dots.....12. *niveus.*

aa. Antennæ either wholly black or with two black marks on each of the two basal joints.

b. Head and thorax either black or trifasciate with black or fuscous; antennæ usually black, when pale the marks on the first joint generally connected at apex.. .....13. *fasciatus.*

bb. Wholly pale greenish or yellowish, translucent; marks on the antennæ elongate, parallel, distinct.....14. *quadripunctatus.*

12. ŒCANTHUS NIVEUS, De Geer. The Snowy Tree Cricket.

*Gryllus niveus*, De G., Mem. pour serv. à l'hist des Ins., III., 1773, 522.

*Œcanthus niveus*, Fitch., Trans. N. Y. State Agric. Soc., XVI., 1856, 404.

Measurements: Length of body, ♂ 10.5 mm., ♀ 11 mm.; of tegmen, ♂ 13.3 mm., ♀ 12.3 mm.; of hind femur, ♂ ♀ 8 mm.; of ovipositor, 4.6 mm.; width of ♂ tegmen, 5.25 mm.

This well-known insect is very common in the cultivated parts of Ontario, where it frequents orchards, vines and shade trees. Its song is the soft rhythmical "treat, treat, treat," which can be heard any evening in late summer or autumn. It is also heard in the day-time in cloudy weather, but at such times is much more subdued.

Of native trees I have found it most partial to butternut, but it occurs on many others. At De Grassi Point, Lake Simcoe, I have often traced the song to the tree from which it came, and it was very often a butternut, but sometimes an elm, maple or other hard wood.

The females are often found on the trunk and lower branches, and are comparatively easily taken, but the males are usually higher up and are quite difficult to obtain.

*Niveus* is generally held responsible for a great deal of mischief done to raspberry and blackberry canes by the females in laying their eggs. It is my belief that most of this damage, at least in this locality, is caused by the other two species of *Œcanthus*, which abound on raspberry bushes, while *niveus* is seldom, if ever, found upon them. *Niveus* comes to maturity about the first week in August and continues till late in October.

Localities: Leamington, Aug. 7, 1901; Arner, Aug. 9, 1901; Chatham, Aug. 10, 1901; Sarnia, Aug. 12, 1901; Goderich, Aug. 19, 1901; Toronto, Aug.–Oct. 13; Lake Simcoe, Sept. 6–21, 1901.

13. ŒCANTHUS FASCIATUS, Fitch. The Striped Tree Cricket.

*Œcanthus fasciatus*, Fitch., Trans. N. Y. State Agric. Soc., XVI., 1856, 414.

*Œcanthus nigricornis*, Walk., Cat. Derm. Salt. Brit. Mus., I., 1869, 93.

Measurements: Length of body, ♂ ♀ 12 mm.; of tegmen, ♂ 11 mm., ♀ 12 mm.; of hind femur, ♂ ♀ 8 mm.; of ovipositor, 5.5 mm.; width of ♂ tegmen, 4.8 mm.

This is by far the commonest tree cricket in Ontario, and during August and September it abounds on shrubs and tall herbs, especially golden-rod, and is particularly plentiful on low grounds. Partially cleared bush lands supporting a rank growth of raspberry bushes, golden-rod, boneset and other tall herbaceous plants are favorite haunts. It is so common on raspberry bushes that there is little doubt that the female is responsible for much damage to the canes, though I have no proof of this assumption. I have found it in cultivated raspberry bushes in gardens, but it is more partial to wild districts.

In shrilling the male elevates the tegmina to nearly a right angle with the body and spreads them to an angle of about 45°. The song is a continuous and rather powerful trill, and is kept up all night and in cloudy weather during the day when the sun is shining. It begins about mid-afternoon.

Localities: Chatham, Aug. 10, 1901; Sarnia, Aug. 12, 1901; Walpole Id., River St. Clair, Aug. 13, 1901; Toronto, Aug.–Sept.; Lake Simcoe, Aug.–Sept.; Goderich, Aug. 19, 1901; Burke Id., Lake Huron, Aug. 27, 1901; Bruce Peninsula, Aug. 23, 24, 1901; Algonquin Park, Aug. 23, 1902; North Bay, Sept. 12, 1900.

14. *Œcanthus quadripunctatus.* The Four-spotted Tree Cricket.

*Œcanthus quadripunctatus*, Beut., Bull. Amer. Mus. Nat. Hist., VI., 1894, 250.

*Œcanthus fasciatus*, Hart., Ent. News, III., 1892, 33 (text in part).

Measurements: Length of body, ♂ 9.5 mm., ♀ 11.5 mm.; of tegmen, ♂ 11 mm., ♀ 12 mm.; of hind femur, ♂ 7 mm., ♀ 7.5 mm.; of ovipositor, 5 mm.; width of ♂ tegmen, 4.5 mm.

I believe this form to be merely a pale variety of *Œ. fasciatus*, as I have a series of intergrades and am unable to draw a definite line to separate the two. I have retained the name *quadripunctatus* for the present, however, as I have an insufficient series of typical examples of this form to make a satisfactory comparison between the two varieties.

*Quadripunctatus* is common in the southern part of the Province, where it is associated with *fasciatus*, but I have never taken typical specimens in the north. Blatchley found it abundant on the north shore of the Niagara River, opposite Buffalo, N. Y.

Localities: Chatham, Aug. 10, 1901; Walpole Id., River St. Clair, Aug. 13, 1901; Toronto, September.

## A NEW GENUS AND SPECIES BELONGING TO THE GEOMETRIDÆ.

BY GEO. W. TAYLOR, WELLINGTON, B. C.

The Geometrid moth described below cannot be placed in any European or American genus known to me, and I therefore venture to institute a new genus for its reception.

The genus belongs to the *Ennominæ*, and the absence of a tongue and the possession of the dorsal abdominal tufts serve to separate it readily from all the other American genera of the subfamily, as none of them, I believe, possess these two characters in combination.

As there is some difficulty, especially for a novice, in finding a suitable combination of Greek or Latin which has not already been used as a generic name in some branch of Zoology, I have named this genus after the island opposite to Nanaimo, V. I., where I took specimens of the species last summer. The species I dedicate to my friend Dr. Dyar, who has given me much help and encouragement since I began my study of the Geometridæ.

*Gabriola*, n. g.—Palpi short, subascending: tongue apparently wanting; front scaled; antennæ ♂ heavily pectinated, pectinations rapidly shortening and leaving apex simple; thorax tufted posteriorly,

loosely scaled; abdomen with dorsal tufts on second, third and fourth segments, the tuft on segment three being the most conspicuous; hind tibiæ of ♂ slightly swollen, with all spurs; fore wings with 12 veins, 5 weak, 10 and 11 from cell; hind wings with all veins separate, 5 undeveloped, 8 separate from cell.

Type: G. Dyari.

*Gabriola Dyari*, n. sp.—Male expands 25 mm. Front, thorax and abdomen gray, with numerous black scales. Thoracic and abdominal tufts tipped with black, a black band on front of thorax and the posterior margins of the abdominal segments are also marked with black scales. Fore wings a warm shade of brown with two very distinct black lines—intra and extra discal. The intra discal line is regularly curved, commencing on the costa at about one-fourth the distance from base to apex, and terminating on inner margin at a little greater distance from base. Extra discal line also very distinct, leaving costa at about two-thirds distance from base to apex, running in a straight line towards central point of hind margin. At vein 5 it turns at right angles and runs in an almost straight line to juncture of veins 3 and 4, thence in a bold inward curve to vein 1, and thence curving in the opposite direction to inner margin. There is an indistinct gray cloud in the middle of the basal area with some scattered black scales. The central area is uniformly brown, peppered with darker scales; no discal dots apparent; outer area brown, with a blackish cloud bordering the extra discal line and becoming a decided blotch on the inner margin. This black cloud is bounded outwardly by a white line, distinct on the costa, then almost obsolete, but reappearing very distinctly below vein 4 and widening, in some specimens, into a large and conspicuous white spot at the inner angle; a marginal row of intervenular black dots. Hind wings paler, with a broad subterminal black shade and an irregular black line across the centre of the wing.

Beneath: the markings of the fore wings are faintly reproduced, but the intra discal line is almost obsolete, and the extra discal, instead of having the double curve as on the upper side, runs in an almost straight line from vein 5 to the inner margin. The lines on the hind wings are also reproduced, the median line being much more distinct than on the upper side, and the subterminal line is broken up into 3 or 4 blotches.

Described from 4 ♂ specimens in my own collection, which were taken in August, 1903. I have seen numerous other specimens, all males, in British Columbian collections, and there are specimens also in the United States National Museum. I have not seen the ♀. The species seems to be not uncommon on Vancouver Island.

# THE DIPTERA OF BRITISH COLUMBIA.

## Second Part.—The Syrphidæ.

BY RAYMOND C. OSBURN, NEW YORK.

(Continued from page 220.)

43. *Sphærophoria micrura,* Osten Sacken.—Two females from Port Renfrew, one July 6, 1901, the other Aug. 16, 1902. The male was taken at Seattle, Wash., July 15, 1901.

44. *Sphærophoria sulphuripes* (Thompson).—One male specimen, taken at Glacier, July 20, 1901, belongs here questionably. It lacks the characteristic bunch of yellow pile on the hypopygium of *cylindrica*, but otherwise resembles that species quite closely.

45. *Sphærophoria melanosa*, Williston.—A single specimen taken by Harvey at Vancouver, May 30, 1903, agrees quite well with Williston's description, except that the cheeks are brownish instead of shining black.

46. *Sphegina infuscata*, Loew.—Not common. Port Renfrew, July 6, 1901. A specimen from Mr. Harvey, Vancouver, April 12, 1902. Taken at Lowe Inlet by Kincaid, June 3 (Coquillett, 1900). The writer has taken the species also at Laggan, Alberta, Aug. 23, 1902. Two other specimens taken by Harvey, one at Vancouver, March 28, 1903, and one at Wellington, I place here provisionally. They are much larger and darker than the typical form, and may be distinct.

47. *Sphegina lobata*, Loew.—Not common. Port Renfrew, July 3, 1901; Glacier, Aug. 20, 1902. These show no difference from Ohio specimens.

48. *Baccha obscuricornis*, Loew.—A single specimen from Port Renfrew, July, 1901; one specimen from Harvey, Vancouver, May 30, 1903. Taken at Lowe Inlet by Kincaid, June 3 (Coquillett, 1900). A single specimen was taken also by the writer at Seattle, July 15, 1901.

49. *Myiolepta bella*, Williston. A single specimen of this fine species taken at Port Renfrew, June 30, 1901.

50. *Volucella facialis*, Williston.—Taken by Harvey at Vancouver, May 17, 1902, and May 30, 1903. The writer has taken the species at Banff, Alberta, July 17, 1902.

51. *Pyritis montigena*, Hunter.—Taken by Harvey at Vancouver, May 2, 1903, and again at Vernon. A number of specimens, only females. A specimen is in my collection from Victoria also. The species was described in 1895 from a single male specimen taken at Moscow, Idaho. As the female has not, to my knowledge, been described, I indicate here the characters.

Very similar to the male, differing only in the following: Eyes widely separated. Front broadly sulcate transversely, below the sulcus shining; in the sulcus and above brownish pollinose. Face above and on the sides also brownish pollinose. The whole body, head and legs covered with whitish or light yellowish pile; the only black hairs present are those on the eyes and aristæ.

I have not been able to compare with the male of this species, but the female answers so well to the description that I have little hesitation in describing it here.

52. *Pyritis Kincaidii* (Coquillett)—(*Volucella Kincaidii*, Coquillett, Ent. News, 1895, pp. 131–2.)

Taken by Harvey at Vancouver, Feb. 14, 1901; Feb. 28, 1903; April 12, 1902; also at Vernon, May 2, 1903. Four specimens, two males and two females.

This species is quite close to the preceding. I have been unable to separate them by any marked anatomical characters, and yet they are quite different in appearance. *P. Kincaidii* averages larger than *P. montigena*, yet they intergrade in size. The chief difference to be noted is in the colour of the pile, which in *montigena* is whitish or light yellowish, while in *Kincaidii* it is dark reddish yellow. The females of *Kincaidii* are exactly like the males in this respect, and, in my specimens, show no tendency to intergrade in colour with *P. montigena*.

53. *Sericomyia chalcopyga*, Loew.—A common species at Port Renfrew, on dates ranging from June 30 to Aug. 16. Mr. Harvey has taken the species at Vancouver, April 12 and Oct. 3, and at Wellington, April 17. The writer has taken the species also at Laggan, Alberta, Aug. 24, 1902.

(*Sericomyia militaris*, Walker. Taken at Laggan, Alberta, Aug. 24, 1902, and will undoubtedly be found in Br. Col.)

54. *Arctophila flagrans*, Osten Sacken.—Port Renfrew, Aug. 10, 1902; Glacier, Aug. 20, 1902. A single male specimen taken at each

locality. Snow says (Kan. Univ. Quart., 1895, p. 242): "So far as I know this species is taken only on the summits of mountains of considerable height." My specimen from Port Renfrew was taken on low ground by the sea shore. The species has not previously been recorded so far north, and perhaps this is only another example of the law that mountain species approach the sea level in higher latitudes.

55. *Eristalis tenax* (Linné).—Abundant everywhere. Taken all summer. Port Renfrew, Victoria, Vancouver, and also at Seattle, Wash. Specimens have also been received from Vancouver, Victoria and Wellington, from Mr. Harvey.

56. *Eristalis latifrons*, Loew.—Victoria, July 17, 1901. Taken also at Banff, Alberta, June 17, 1901.

57. *Eristalis montanus*, Williston.—A single specimen, female, taken at Vernon, Sept., 1902, by Harvey.

The eyes are separated about as in the female of *bastardi* or *occidentalis*. The front is reddish-yellow pollinose on the sides like the face; vertex black pilose. The centre of the disk of the thorax has some black pile intermixed with yellow. Otherwise the specimen tallies exactly with Williston's description, and I have no hesitation in placing it here.

58. *Eristalis occidentalis*, Williston.—Apparently a common species. Port Renfrew, Aug. 16, 1901; Victoria, July 20, 1902. Specimens from Harvey, taken at Vancouver, June 21, 1902, and July 20, 1903.

59. *Eristalis flavipes*, Walker.—A single specimen from Harvey, taken at New Westminster.

60. *Eristalis obscurus*, Loew.—Port Renfrew, Aug. 10, 1901; Agassiz, July 18, 1902. Taken by Harvey, Vancouver, July 29, 1902. The writer has taken the species also at Seattle, Wash.

61. *Eristalis hirtus*, Loew.—Two specimens, taken by Harvey at Mt. Cheam, Aug. 5, and another at Vancouver, Aug. 29, 1903.

62. *Helophilus latifrons*, Loew.—One specimen sent me by Harvey, taken at Vernon.

(*Helophilus similis*, Macquart, Banff, Alberta, June 17, 1902.)

63. *Helophilus bilinearis*, Williston.—One specimen at Port Renfrew, July, 1902. Taken also at Seattle, Wash., July 15, 1901. These show no important differences from specimens taken at Fargo, N. Dak.

64. *Helophilus pilosus*, Hunter.--Described in 1897 from Br. Col., one female specimen. No other data given. I have not seen the species.

65. *Pterallastes perfidiosus*, Hunter.—Described in 1897 from two female specimens from Br. Col. No other data given. I have not seen the species.

66. *Triodonta curvipes* (Wiedmann).—A male and female of this peculiar species taken at Victoria, July 20, 1902, are a trifle larger and darker in colour than specimens from the Atlantic coast, but in other respects are similar.

67. *Criorhina Kincaidii*, Coquillett.—Taken by Harvey, at Vancouver, April 9 to May 19, and at Wellington, April 17. In all, 10 specimens of this striking species, nine males and one female, have been sent me by Mr. Harvey. They show considerable variation in colour of the pile of the thorax and abdomen, but otherwise all agree very well with Coquillett's description. The pile of the thorax varies in regard to the extent of the black, which may include all of the hinder part of the mesonotum except the angles, and all of the scutellum except a fringe of yellow hairs around the edge, or the black may be limited to a bar across the mesonotum, leaving the hind border as well as the scutellum yellow. The greatest variation, however, is seen in the pile of the abdomen. As one extreme, the pile of segments 2 and 4 is light yellow, with that of 3 black, or at most with a few reddish hairs intermixed, while at the other extreme, segments 2, 3 and 4 are covered with reddish pile, with no trace of black on 3. Practically all the intermediate stages are shown by my nine specimens. All agree in having long light yellow pile on the side of segment 2, in having some yellow on the posterior margin of 4, and in having 5 black, with at most a few reddish hairs. In most of my specimens a fringe of long yellow hairs projects, moustache-like, from the epistoma in front. It appears to be broken off in some specimens. The tibiæ and tarsi vary in colour from brownish to yellowish. The last joint of the tarsus is always brown except the pulvilli, which may be yellow.

The female resembles the male closely. The face is only thinly pollinate with yellow. The eyes are separated by about the length of a millimeter. The front is coloured as in the male. The vertex is black.

68. *Criorhina tricolor*, Coquillett.—Vancouver, May 10, 1902; Mt. Cheam, Aug. 5–11, 1903; Grouse Mt., July 19, 1903. Nine specimens in all, both sexes, from R. V. Harvey. I have placed these specimens in this species provisionally, as I have not been able to make out any

structural differences to separate them from *tricolor*. They differ considerably from Coquillett's description in colour markings, and may be a distinct species, but, knowing the tendency of related species such as *C. Kincaidii* and *C. nigripes* to vary in this respect, I hesitate to separate them until further study. Coquillett's type is from Alaska.

69. *Criorhina nigripes* (Williston).—Vancouver, April 9 and 11, 1903, taken by R. V. Harvey. Two specimens, both females. One of these has a distinct margin of yellow hairs on the hinder border of abdominal segments 2 and 3. Otherwise they are identical with Williston's type from California in the Mus. Comp. Zool., at Cambridge, Mass.

70. *Criorhina scitula*, Williston.—Taken at Port Renfrew, Aug. 10, 1902, and by Harvey, at Vancouver, June 22, 1902, and at Mt. Cheam, Aug. 5–10, 1903.

71. *Crioprora alopex* (Osten Sacken).—A specimen was sent me by E. M. Anderson, taken at Victoria, April 16, 1897, and another was received from Harvey, taken at Vancouver, April 12, 1902, both females. I have seen no description of the female, but it is very much like the male in all respects except the following: Eyes widely separated; the yellow-red pile of the front continued back upon the occiput at the middle. Pile of the scutellum light yellowish; in one specimen a few black hairs on the margin; the other has the pile entirely without black.

72. *Crioprora femorata*, Williston.—A single specimen taken by Harvey, at Wellington, April 15, 1903.

73. *Pocota grandis* (Williston).—Harvey has taken this species at Vancouver, Oct. 3, 1902, and at Mt. Cheam, Aug. 7, 1903. Two females are in my possession. They are essentially like the male, differing only in the separation of the eyes. The rather broad front is brownish pruinose, with short dark yellow pile. On the under side the middle tarsi are beset with short sharp black spines, not present on the other tarsi.

74. *Brachypalpus pulcher*, Williston.—Port Renfrew, July 25, 1902, and by Harvey, at Goldstream, Aug. 10, 1902. A specimen is also in my collection marked "Br. Col., Sept. 5, 1897." Both sexes present. The species is described from Washington and Oregon.

75. *Xylota fraudulosa*, Loew.—A single male specimen taken at Port Renfrew, June 26, 1901, undoubtedly belongs here, though a trifle larger than my eastern specimens. It has been recorded in the west from Washington.

76. *Xylota barbata*, Loew.—Port Renfrew, July 25, 1902, and Glacier, Aug. 21, 1902, and by Harvey, at Vancouver, June 19, 1903. Taken also at Seattle, Wash.

77. *Syritta pipiens* (Linné).—Abundant. Port Renfrew, Victoria, Vancouver, Agassiz and Glacier, at dates ranging from July 17 to Aug. 19. Harvey has taken it at Vancouver, June 19, 1903. Taken also at Laggan and Banff, Alberta.

78. *Sphecomyia Pattoni*, Williston.—A single male specimen taken at Glacier, Aug. 21, 1902, I place here with some doubt. In general appearance it is much like *Pattoni*, but it shows the following differences: The ground colour of the face seems to be entirely dull black under whitish pollen, and there is no shining facial stripe; the spots of the thorax white instead of yellow, and there is a fringe of yellow pile on the scutellum; the legs differ in the extent of yellow and black. It may be a distinct species. The type locality of *Pattoni* is Washington.

## SOME NOTES ON APHIDIDÆ.

BY T. D. A. COCKERELL.

*Macrosiphum ambrosiæ* (Thomas). — *Siphonophora ambrosiæ*, Thomas, Bull. Ill. State Lab. Nat. Hist., 1878, p. 4.

Found at Pecos, New Mexico, on *Lactuca*. The following account is based on the Pecos specimens:

Very dark brown, very shiny; legs, antennæ and nectaries black, except that the basal part of legs, to near middle of femora, is brownish-white; stigma pale green; cauda of winged ♀ yellowish-white. Measurements of winged ♀ in $\mu$: Marginal cell about 900, of which about 340 is substigmatal; cubital vein between branches 850 to 970; cauda 450; nectaries about 820, minutely imbricated; beak about 950, last joint about 160; antennal joints, (1) 130, (2) 80, (3) 900, (4) 750, (5) 725, (6) 200, (6a) 1,130; 3 has numerous sensoria on the under side, 4 has no sensoria; the hairs on 3 and basal half of 4 are knobbed, as also are practically all those on the anterior legs.

Young dull reddish, minutely tuberculate, not pruinose.

This Pecos form may be separable as a variety; in Schouteden's table of European species it runs to *M. cichorii* (Koch). It certainly is not *M. muralis* or *M. lactucæ*.

*Pemphigus lucifugus* (Zehnt.).—*Tetraneura lucifuga*, Zehntner, De Plantenluizen Van het Suikerriet op Java, XV. (1901). Pl. 2, figs. 29–34.

By the venation of the hind wings this cannot be a *Tetraneura*.

*Cladobius Beulahensis*, n. sp.—Winged ♀: Rather large, robust; head and thorax black; abdomen grayish-brown, dorsum with a broad, dull black band on each segment, sides with large black spots; on the first four segments there is a considerable interval between the bands and the spots; ventral surface of abdomen immaculate, except that the last segment bears a large transverse black spot; insect thinly clothed with short hairs; legs very hairy, dark ferruginous; knees, end of tibiæ, and tarsi black; wings ample, hyaline, not darkened along the veins, stigma large, grayish-brown, fork ample, but shorter than its stem; antennæ reaching second abdominal segment, blackish, third segment ferruginous; cauda broad and rounded, hairy, not produced; nectaries short, distinctly swollen, ferruginous, black at apex, very much longer than broad; beak reaching posterior margin of middle coxæ, or at least their base. Length of insect, 3⅓–3½ mm. Measurements in $\mu$: Antennal joints, (3) 500, (4) 260–290, (5) 250, (6) 170, (6b) 310. Nectaries about 250. The prothorax has a lateral tubercle.

Young dark gray, slightly purplish; femora dull whitish.

Beulah, New Mexico, prox. 8,000 ft., Aug. 4, on *Populus tremuloides*, in little colonies (winged and young) on the twigs. The leaves of the tree were much curled, I suppose by the aphides. Related to *C. bicolor*, but not identical; also clearly distinct from *C. salicti*. By the banded abdomen it resembles *C. pilosus* (*Pterocomma pilosa*, Buckton), but it is not the same. It is not *C. salicis*, and it is certainly not *C. populeus*, as that insect is figured by Buckton. There seems to be some confusion about *C. populeus* (sometimes called *populneus*); it has been recorded from Greenland (Rübsaamen) and Alaska (Pergande), and might be expected in the Rocky Mountains,* but so far as I can make out our insect is quite distinct from it.

*Aphis medicaginis*, Koch.—Abundant at Pecos, New Mexico, on *Glycyrrhiza lepidota*. Some were found on *Sphæralcea Fendleri* growing near the *Glycyrrhiza*.

*Lachnus viminalis* (Fonsc.) = *dentatus*, Le Baron.—Pecos, New Mexico, 1903, on *Salix*. New to New Mexico.

*Chaitophorus negundinis*, Thos.—Pecos, N. M., 1903 (Dr. M. Grabham). *C. populicola*, Thos., was also found at Pecos.

Thirty-eight Aphididæ are known from New Mexico so far.

*The willow-coccid *Eriococcus borealis*, described from Dawson City, N.-W. T., has since been found by me at Beulah, New Mexico.

## NEW SPECIES OF NORTH AMERICAN LEPIDOPTERA.

BY WILLIAM BARNES, S. B., M. D., DECATUR, ILL.

(Continued from page 244.)

*Prothymia rosario*, n. sp.—Expanse: 26 mm.

Fore wings chrome yellow, a pink patch at base of wing, about 3 mm. wide; this is most marked on costa and between median and submedian veins. A subterminal pinkish band, broad at base, where it is confluent with the pink fringe; at centre is narrow and furthest removed from margin, at inner angle it broadens out, becoming again confluent with fringe. Fringe pink, in one specimen slightly paler inwardly. Hind wings pale yellowish white, fringe concolorous.

Beneath, fore wings pale yellowish along costa, outer and inner margins, dusky centrally, with indications of discal dot, pinkish spot at apex. Hind wings as above. Thorax and abdomen yellowish, head darker yellowish, more or less pink intermixed. Palpi yellowish, pinkish at tip. Legs pink externally, pinkish internally.

Type: ♂ and ♀. Huachuca Mts., Arizona, July. One of the specimens from Mr. Poling.

*Apatelodes uvada*, n. sp.—The general type of maculation is similar to *A. lacetania*, Druce (Biol. Cent. Amer., Vol. II., 437, Pl. 87, fig. 12 and 13), and to *A. diffidens*, H. E. (Entom. Amer. III., 92; Biol. Cent. Amer. II., 438, Pl. 87, fig. 15), but in detail there is a marked difference from the figures as well as from the descriptions. Fore wings light gray, with pale brown shadings, the whole with a slight olivaceous tinge. As in *diffidens*, there is a straight brownish line from junction of basal and middle thirds of costa almost to inner angle. Below this line the wing is gray, above it more or less shaded with brown. On inner margin at inner third are two black spots, one on margin, the other above and extending a trifle farther outward, separated more or less distinctly from first. Beyond these, and only separated from them by a narrow space of ground colour, is a short black bar, which becomes lost before reaching oblique line. The course of the bar and spots is obliquely outward from inner margin, and they seem to be the remnants of a double transverse line, which if angled in the middle of the wing and then run inwardly would strike costa at beginning of oblique line. In one specimen a slight thickening of the oblique line on costa seems to represent a remnant of the transverse line. About 2 mm. further outward a second transverse brown line can be made out; in one specimen this is evidently double on

inner margin. It passes from costa outwardly oblique, along inner side of discal spot to oblique line, whence making somewhat of an angle it runs obliquely inward to inner margin; it is rather faint, but can be followed in both specimens its whole length. A third more distinct brown transverse line leaves costa at outer third, curving outwardly around cell; it then makes a broad inward curve to inner margin at about its outer fourth. Another transverse line runs parallel to third and about 2 mm. from it; it is pale whitish, but in one specimen there is a quite well marked brown inner edging to this, especially at costa and inner margin. In the other specimen this it not so evident. There are two superimposed subapical black wedges, base outwardly, resting on a short pale bar, which terminates below in a small round pellucid dot, which has a minute black dot to its outer side. On holding the wing against the light the pellucid dot is very striking, and there can be seen a second very minute one just above it. Beyond cell the marginal area it clear brownish, but at apex it is mostly gray, and below centre of wings the pale shading on veins, and a broad, rather diffuse included gray shade, cover fully half the space. Fringe brown. Discal spot small, pale, upright. Secondaries reddish brown, with distinct pale mesial band; within this is a narrow dark band, distinct in one specimen, fainter in the other. This terminates in the upper of two brownish black spots on inner margin, well above inner angle. The second lies on upper side of termination of mesial band; in one specimen the spots are somewhat run together. Fringe concolorous or a shade paler.

Under side of primaries reddish, washed with gray along costa, darker reddish brown at apex beyond the distinct pale bar which corresponds to the one on upper surface. A dark reddish extra mesial band and a pale subterminal one. Secondaries: upper two-thirds reddish, lower third pale, the line between the shades being quite sharply defined, very distinct dark reddish brown mesial and pale extra-mesial bands, the latter especially towards inner margin slightly edged on inner side with brown. Very faint, scarcely discernible traces of discal spots on both wings. Head and thorax concolorous with base of primaries, abdomen with secondaries. Patagia gray, with brown transverse band, near but not quite at tip. Palpi, coxæ and inner side of fore tibiæ brownish, rest of legs gray, abdomen beneath fuscous, laterally with small blackish tufts.

Types: 2 ♂'s. Pima Co., Arizona, July. Mr. Poling. It is possible this may be the same as Dr. Dyar's *pudefacta*, the description of which has just reached me.

*Hemiceras pilacho*, n. sp.—Expanse : 28 mm.

Ground colour pale yellow, rather thinly dusted over with golden yellow scales. Body parts with more of a brownish tint. Front of head with round turreted projection, yellowish brown, with black centre and black ring. Thorax, largely denuded in the specimen before me, is somewhat darker than abdomen. T. a. line somewhat outwardly oblique, formed of three large teeth, one from costa to median vein, one between median and submedian veins, third between latter and inner margin, dark golden yellow. T. p. line runs from junction of outer and middle thirds of inner margin obliquely outwards almost to apex, where it curves inward slightly before reaching costa, the same colour as t. a. line. A very faint trace of s. t. line, scarcely to be noticed. Ordinary spots concolorous, outlined with golden yellow scales. Orbicular large, round. Reniform large, oval, slightly inwardly oblique, joined to orbicular by a slightly thicker accumulation of the dark yellowish scales than elsewhere. Veins of wings slightly darker. Fringe fuscous, with an even dark golden yellow basal line. Hind wings white, with a faint yellowish tinge, very slightly dusky at extreme edge. Fringe concolorous, faint, slightly darker, basal line.

Beneath very pale yellowish colour. Orbicular and reniform showing as obscure paler spots in cell. T. p. line showing faintly through wing. Wing very slightly darkened through cell and along veins beyond it. Hind wings pale yellowish white, slightly darker along costa.

Type : 1 ♂, So. Arizona. Mr. Poling.

*Eunotela moqui*, n. sp.—Expanse : 33 mm.

Fore wings light gray, with a slight reddish flush. Basal line double, slightly angled on median vein, inner portion black, outer brownish. Beyond this a diffuse black shade across wing, outwardly curved to median vein, then inwardly curved to inner margin. T. a. double, black, distinct, slightly outcurved. A small diffuse black spot on costa beyond t. a. line. T. p. line double, inner portion black, outer brown, distinct and scalloped between veins below cell, both lines brown opposite cell, lunular and preceded by a distinct black lunular bar in cell, which is continued to costa, after making a slight angle on subcostal vein. S. t. line irregular, broken, somewhat diffuse, not sharply defined, more pronounced in upper two-thirds of wing, at costal end a small black dash running almost but not quite to apex. Distinct black terminal line, quite even in upper, somewhat irregular in lower half. Veins more or less darkened. Fringe

concolorous, with pale points at end of veins. Hind wings white above and below. Fore wings smoky beneath, with about four pale points on costa, towards apex. Antennæ shaft yellow, pectinations brown. Head and thorax dark gray. Abdomen ochraceous above, dirty white below.

♀, fore wings a trifle darker, with markings somewhat heavier, especially the terminal line, while the subterminal line is equally heavy to inner margin. Secondaries broadly fuscous outwardly, with faint mesial band.

Type: 1 ♂, So. Arizona, July; 1 ♀, Santa Catalina Mts., Pinal Co., Ariz. Mr. Poling.

*Hapygia estrella*, n. sp.—Closely allied to *H. xolotl*, Schaus (Proc. Zool. Soc., London, 1892, p. 339; Biol. Cent. Amer. II., 464, Pl. 91, fig. 19), but differs from figure and description, and Mr. Schaus, who on a recent visit kindly examined most of the species described in the present paper, thinks it distinct from his species.

♂ expanse: 50 mm.; ♀, 57 mm.

Colour of male chestnut, of female darker, almost walnut-brown. Basal line faint but traceable, pale, with dark brown border. T. a. faint, outwardly oblique, somewhat wavy, pale, with slightly darkened border. In female there is a dark shade between t. a. and basal line on lower half of wing. T. p. line pale, with slightly darker outer border, distinct but not prominent, inwardly oblique from costa, slightly outcurved over cell, then with a slight inward curve to inner margin. A faint black, broken subterminal line, emphasized at apex so as to form a short oblique apical dash, within which is a metallic silver mark. In cell is a slightly outwardly oblique oblong silver ring, constricted in middle, with small dot of silver joined to its upper inner side. The centre of ring is silver filled, leaving a narrow border of ground colour. There is a second small round silver spot in cell to inside of upper end of first; in the female this has a fine central dot of ground colour, in the male it is solid. Fringe concolorous outwardly, paler within. Inner margin incised and toothed, more marked in female. Hind wings paler than fore, pale reddish fuscous in male, blackish fuscous in female.

Beneath fore wings much paler than above, even light reddish brown, somewhat darker in centre and along costa. Two pale spots in cell

corresponding to silver spots above. Hind wings still paler, with faint traces of mesial band in female. Head, collar, patagia and thorax concolorous with fore wings. Abdomen with more of a yellowish tinge above, beneath paler.

Types: 1 ♂, 1 ♀, Pima Co., Arizona, July. Mr. Poling.

*Gloveria coronada*, n. sp.—Expanse: ♂, 70 to 85 mm.

Chocolate brown, one specimen slightly grizzled with gray. Hind wings a shade lighter than fore. Fore wings with two pale whitish transverse lines, one at inner fourth, moderately outcurved, even, distinct, about ½ mm. in width. Outer line at about outer third broadly outcurved around cell, then with slight inward curve to inner margin, at a point somewhat beyond middle. The two lines are thus about twice as widely separated on costa as on inner margin. The subterminal space is somewhat paler than the concolorous terminal, in one specimen markedly so. The subterminal line is only indicated by the contrast between the two; it is irregularly dentate, the pale extending outward along the veins, almost to margin in places. A minute pale discal dot. Hind wing with faint trace of pale mesial band. Fringes concolorous, extreme edge whitish. Head and thorax concolorous, abdomen paler. Beneath fore wings much paler than above, hind wings grayish at base, gradually darkening to outer margin, where it is same shade as fore wings. Distinct pale mesial band on both wings, fading out on hind wings before reaching inner margin. There is a brown inner accompanying shade line, more or less evident, especially on hind wing. Thorax and legs concolorous with fore and abdomen with hind wings. Antennæ brown.

Types: 4 ♂'s, Huachuca Mts., Arizona; 1 ♂, Chiricahua Mts., Ariz. Mr. Poling.

The colour and maculation remind one very strongly of *psidii*, but the shape of the wings is altogether different, being much broader, more like *Io*, or judging from the description, like *quadrina*.

The above description applies to four of our specimens, a fifth, however, more recently received from the Chiricahua Mts., has the ground colour of the fore wings replaced by gray to a much greater degree, the transverse lines appearing brown, with faint pale accompanying shades, and the subterminal line as an irregular row of brown spots. The variation being the same so commonly seen in *Malacosoma (Clisiocampa)*.

## LIST OF ADDITIONAL MANITOBA LEPIDOPTERA.

BY E. FIRMSTONE HEATH, CARTWRIGHT, MAN.

Since Mr. A. W. Hanham published his lists of Manitoba Lepidoptera in the CANADIAN ENTOMOLOGIST (1897–1901), many additional species have been taken in the Province by myself and others. Where no special locality is given in the following list, the capture was made by me on my farm on the Long River, and in almost every instance the identification has been made by Dr. John B. Smith, to whom my warmest thanks are due for the kindly trouble that he has taken with my material.

Sphinx Vancouverensis, Hy. Edw.—At light during June and July in about equal numbers with the form *albescens*, Tepper.

Hyphantria textor, Harris.—Only one at light in July.

Apantesis determinata, Neum.—A form of *Williamsii*, Dodge, in the previous list.

Apantesis michabo, Grote.—Rounthwaite, May 20 (Marmont).

Apantesis oithona, Strecker, *a.* rectilinea, French.—At light at Rounthwaite, Aug. 5 (Marmont). Bred from larvæ on *Castilleja sessiliflora* at Aweme (Criddle and Fletcher).

Thyris lugubris, Boisd.—Rounthwaite (Marmont). Sandhills near Aweme, flying in bright sunshine, July 20 (Criddle and Fletcher).

Alypia octomaculata, Fabr.—Several taken flying in the sunshine about wild raspberry bushes when in flower, together with *Langtonii*, Couper.

Acronycta hastulifera, Sm. and Abb.—July ; taken at sugar occasionally.

Acronycta leporina, Linn.—Several taken at sugar, June and July, 1899.

Acronycta superans, Guén.

Acronycta albarufa, Grote.—July ; at sugar occasionally.

Acronycta inclara, Smith (hamamelis, Guén).

Acronycta illita, Smith.—June ; at sugar. This is one of the earliest to appear.

Acronycta modica, Walk.—One taken at sugar in July.

Moma geminata, Smith.—Previously recorded as *fallax*, H.-S.

Platysenta videns, Guén.—July ; several at sugar and light.

Hadena vultuosa, Grote.—June 25, etc. ; sometimes plentiful at sugar.

Hadena cogitata, Smith.—June ; a few at sugar most years.

Hadena lona, Strecker (runata, Smith).—July ; a few at sugar. Winnipeg at end of June ; a few at light (Hanham).

Hadena ferens, Smith.—August ; at sugar, one only taken in 1903.

Hadena adnixa, Grote.—August ; at sugar, one only taken in 1903.

Hadena claudens, Walk.—August ; a few at sugar.

Hadena allecto, Smith.—Kinosota (Hutchinson) ; also taken in British Columbia and Dakota.

Adita chionanthi, Sm. and Abb.—Several at sugar ; August, 1900 and 1901.

Rhynchagrotis gilvipennis, Grote. This was prevously reported under the name *chardinyi*, Boisd.

Euretagrotis sigmoides, Guén.—Not infrequently at sugar in July.

Euretagrotis attenta, Grote.—With the preceding species.

Noctua rosaria, Grote.—Previously recorded as *rubifera*, Grote. It is generally abundant both at light and sugar during June and July, whereas *rubifera* is scarce here, one only having been identified in my collection by Dr. Smith.

Noctua inopinatus, Smith.—One only recognized so far.

Chorizagrotis soror, Smith.—One taken at sugar or "honey-dew" on black cherry with others of the genus ; in June.

Chorizagrotis auxiliaris, Grote.—Several at sugar and honey-dew in June.

Chorizagrotis agrestis.—With the preceding species.

Chorizagrotis balanitis, Grote.—One taken at sugar, July 8, 1903.

Euxoa maimes, Smith.—Two taken at light with *divergens* in May ; the two species have previously been confused. Brandon (Hanham).

Euxoa citricolor, Grote.—One at sugar, Sept. 29, 1903.

Euxoa acornis, Smith.—Occasionally at sugar in July.

Euxoa fuscigera, Grote.—Several at sugar, July and August, 1903.

Euxoa intrita, Morr.—Found among some duplicates, date wanting.

Euxoa titubatis, Smith.—A few at sugar in July.

Euxoa verticalis, Grote.—A few at sugar in July.

Euxoa albipennis, Grote.—A few at sugar in July.

Euxoa furtivus, Smith.—A few at sugar, July and August.

Euxoa perexcellens, Grote.—Occasionally at sugar with *insulsa*.

Euxoa abar, Strecker.—One at sugar, Sept., 1903.

Euxoa nordica, Smith.—Occasionally at sugar, June and July.

Prodenia ornithogalli, Guén.—Winnipeg, at sugar, Oct. 19, and later, 1900 (Hanham).

Psaphidia Grotei, Morr.—Winnipeg and Brandon, rare (Hanham).

Ufeus satyricus, Grote.—At sugar, others in the house in October.

Mamestra imbrifera, Guén.—A few at sugar in June.

Mamestra Oregonica, Grote.—At sugar with *trifolii*.

Mamestra Goodellii, Grote.

Mamestra lucina, Smith.—At sugar. Previously recorded as *olivacea*, Morr.

Mamestra circumvadis, Smith.—Aweme (Criddle).

Nephelodes tertialis, Smith.—Winnipeg, August 16–24 (Hanham).

Rancora albicinerea, Smith.—Rounthwaite, April 24 (Marmont).

Bellura gortynoides, Walk.—A few taken at light, decidedly rare June 18–30.

Morrisonia sectilis, Guén.—A few at sugar, August 12, 1903.

Leucania minorata, Smith.—Previously listed as *pallens*, Linn.

Leucania obscurior, Smith.—Previously listed as *albilinea*, Hubn.

Leucania megadia, Smith.—At light in July. At first confused with *insueta*, Guén.

Himella contrahens, Walk.—Listed as *thecata*, Morr.

Tæniocampa peredia, Grote. Two or three at sugar, July, 1900. Not seen since.

Xylina hemina, Grote.—Several at sugar, during October, 1903.

Xylina amanda, Smith.—Previously listed as *contenta*, Grote, which does not seem to occur here.

Xylina holocinerea, Smith.—Several at sugar, during September and October, 1903.

Xylina Oregonensis, Harvey.—One only at sugar, in October.

Xylina unimodia, Lint.—Several at sugar, in September and October.

Xylina Grotei, Riley.—Several at sugar, in September and October.

Xylina antennata, Walk.—Several at sugar, in September and October.

Xylina tepida, Grote.—Several at sugar, in September and October.

Xylina, n. sp., in Dr. Smith's hands for description.

Cucullia postera, Guén.—Taken but once, some years ago.

Nonagria subflava, Grote. Taken occasionally at light in the middle of August, both here and at Winnipeg.

Papaipema rigida, Grote.—Listed before as *cerina*, Grote.

Papaipema nebris, Guén.—One taken at light in August.

Papaipema circumlucens, Smith.—A few at light in August.

Pyrrhia umbra, Huful.—One at currant bloom, in May, and a few at sugar, in August and September.

Orthosia decipiens, Grote.—Winnipeg.

Orthosia inops, Grote.—A few at sugar.

Cosmia punctirena, Smith.—A few at sugar, in August, 1900.

Epiglæa decliva, Grote.—Several at sugar, September and October, 1903.

Copablepharon grandis, Streck.—One only, at light, August 1, 1899.

Heliothis armiger, Hubn.—One at light, Winnipeg (Hanham).

Xanthoptera semiflava, Guén.—A few taken nearly every year on the prairie in the day time, by beating clumps of *Eleagnus argentea*, in July.

Melicleptria villosa, Grote.—At St. James, Winnipeg, taken in 1900, July 29 (seven), Aug. 4 (seven), Aug. 5 (five). A white daisy-like flower, *Erigeron glabellus* (determined by Dr. Fletcher), occurred in scattered patches in a meadow, and these pretty little moths were all found resting on the centre of the flowers. They were hard to see, and more often than not would fall to the ground and lie close to escape capture (Hanham).

Syneda Athabasca, Neum.—Beulah.

Syneda Alleni, Grote.—Aweme.

Catocala abbreviatella, Grote.—One or two at sugar, late in July.

Homoptera unilineata, Grote.—A few at sugar, May 13; also flying about cherry and plum bloom.

Erebus odora, Linn.—Winnipeg, August 14, 1900. A male with wings rather frayed alighted on a tree when I was renewing the sugar on it at dusk (Hanham). Beulah (Dennis).

Epizeuxis rotundalis, Walk.—A few at sugar, in July.

Zanclognatha protumnusalis, Walk.—A few flying in July.

Ianassa Coloradensis, Hy. Edw.—One only; July 10, 1903.

Schizura concinna, Sm. and Abb.—Reared from larvæ some years ago; they were quite numerous on Populus aspen; larvæ not seen since. One moth taken at light.

Drepana arcuata, Walk. One taken on the wing in June.

# SYNOPSIS OF PROSOPIS AND COLLETES, WITH SUPPLEMENTARY NOTES AND DESCRIPTIONS.

BY CHARLES ROBERTSON, CARLINVILLE, ILLINOIS.

This paper belongs with the series on local species—Andreninæ, Megachilidæ and Bombinæ, Tr. Am. Ent. Soc., *28*: 187; *29*: 163; Sphecodinæ, Ent. News, *14*: 103; Balictinæ, Nomadinæ, Epeolinæ, Anthophila, CAN. ENT., *34*: 245; *35*: 172, 284; *36*: 37.

For the length of the malar space is taken the shortest distance between the eye and the mandible; the breadth is that of the mandible at base; joint refers to antenna, segment to abdomen; cells $III_5$ and $III_4$ are the second and third submarginal cells.

Of 81 specimens formerly referred to *P. modesta*, Say, 45 are referred to *P. Illinoiensis*, and 36 to *P. Sayi*, sp. nov. I have given up the attempt to identify *P. modesta*, Say. The type of *P. Sayi* is a pair taken in copula on flowers of *Heracleum lanatum*, June 4, 1888. Both have a dot on tegula.

According to my separation of them, *P. Illinoiensis* sometimes has a dot on tegula, and *P. Sayi* often has. The determination of *P. affinis* thus becomes more doubtful than ever. I use the name *P. ziziæ* for the insect I have always called *P. affinis*, Sm.

## PROSOPIS, Fabricius.

### Females

Front coxa with a lateral tooth: eyes short; cheeks broad; face marks, tubercles, sometimes two lines on collar, front and middle knees, and base of hind tibiæ, yellow; enclosure of metathorax rugose on basal middle; 6 mm ..... thaspii.

Front coxa simple; eyes long; cheeks narrow; at least bases of tibiæ yellowish; metathorax usually more rugose ..... 1.

1. Segment 1 and base of 2 red; face marks, tubercles, and dot on tegulæ, yellow; wings beyond middle clouded; 6–7 mm ..... nelumbonis.
   Segments 1–6 black ..... 2.
2. Collar with yellow marks; tubercles and face marks yellow; 5–6 mm. 4.
   Collar black; 4–5 mm ..... 3.
3. Entirely black, except bases of tibiæ and sometimes narrow lines on face; slender ..... saniculæ.
   Clavate face marks present; usually a spot on clypeus, tubercles and tegulæ; a little more robust ..... pygmæa.

4. Edge of wing base and spot on tegulæ yellow.....ziziæ.
   Edge of wing base black; tegulæ black; sometimes with a yellow dot .....5.
5. Metathorax more rugose, more pubescent; enclosure less distinct, bordered by an impressed line, often obscured by the reticulations; face marks more yellow, less produced, more rounded on eye margin; wings more fuscous: flagellum darker; rarely a dot on tegula .....Illinoiensis.
   Metathorax less rugose, less pubescent; enclosure more distinct, bordered by a raised line; face marks paler yellow, more produced and pointed on eye margin; wings more hyaline; flagellum paler beneath; tegula often with a yellow dot; *sp. nov.*: 36 specimens .....Sayi.

Males.

Front coxæ with a lateral tooth; metathorax moderately rugose; spot on labrum, scape exteriorly, two lines on collar, and tubercles, yellow; face marks somewhat club-shaped on the sides; 5 mm.....thaspii.

Front coxa simple; metathorax more rugose; at least the face, tarsi, anterior tibiæ in front, and middle and hind tibiæ at base, yellowish .....1.

1. Base of abdomen red; 6 mm .....nelumbonis.
   Base of abdomen black.....2.
2. Face mark broken into four parts by the irregular encroachment of black in the sutures; elsewhere black, except on the legs; scape broad, clavate; 4–5 mm.....saniculæ.
   Face mark entire; tubercles coloured.....3.
3. Lateral extension of face mark usually club-shaped, always diverging from eye; scape exteriorly and sometimes dot on tegulæ pale yellowish; 4 mm.....pygmæa.
   Lateral extension of face mark ending near eye; usually two lines on collar; 5–6 mm.....4.
4. Scape concave exteriorly; spot on tegulæ, edge of wing base, labrum, mandibles more or less, often the scape exteriorly, yellow; face mark club-shaped laterally; yellow at base and apex of middle tibiæ connected.....ziziæ.
   Scape ordinary; tegulæ, labrum and mandibles rarely with yellow...5.

5. Middle and hind tibiæ with a blackish spot behind, hind ones often entirely yellow; segment 1 impunctate; face mark sometimes club-shaped laterally; flagellum darker; tegulæ unspotted; wings more fuscous ..... Illinoiensis.

Middle and hind tibiæ yellow at base; segment 1 punctate; face mark pointed on eye margin; flagellum paler beneath; tegulæ sometimes spotted; wings hyaline ..... Sayi.

COLLETES, Latreille.

Females.

Front coxæ with distinct hairy spines; malar space one-fifth to one-fourth as long as wide; 9–11 mm ..... 8.

Front coxæ without distinct hairy spines ..... 1.

1. Thorax above with pubescence ochraceous, not mixed with black; 10–11 mm ..... 7.

Thorax above with pubescence griseous, mixed with black ..... 2.

2. Ventral segment 6 bicarinate; metathorax rounded, with triangular, rugose reticulated enclosure; joint 3 longer than 4 or 5; malar space one-third as long as wide; 9–11 mm ..... compactus.

Ventral segment 6 simple; metathorax truncate, with transverse series of subquadrate pits ..... 3.

3. Hind metatarsus about twice as long as broad; clypeus broadly sulcate; labrum concave, striate; joint 3 nearly = 4–5; spurs dark; malar space one-fourth as long as wide; 9–11 mm... latitarsis.

Hind metatarsus three or four times as long as broad ..... 4.

4. Postscutel anteriorly with transverse series of subquadrate pits; rather bare; coarsely punctured; malar space linear; 10–12 mm.. nudus.

Postscutel anteriorly without transverse series of subquadrate pits.. 5.

5. Clypeus in profile strongly convex, closely and evenly punctured; joint 3 nearly = 4–5; malar space linear; 9–10 mm.. brevicornis.

Clypeus in profile slightly convex, somewhat sulcate, puncto-striate. 6.

6. Malar space more than one-third as long as wide; clypeus shining, coarsely puncto-striate; front coxæ simple; 12–13 mm.. inæqualis.

Malar space hardly one-third as long as wide; clypeus opaque, finely puncto-striate; front coxæ with blunt spines; 9–11 mm.. Willistonii.

7. Clypeus opaque, finely punctured, not sulcate; pubescence of mesonotum very fine and dense; abdomen opaque, finely punctured, fasciæ very even; nervures pale; malar space about one-fifth as long as wide ..... speciosus.

Clypeus shining, coarsely puncto-striate, sulcate; abdomen shining, rather coarsely punctured, fasciæ often obscured by moisture; nervures dark; malar space about one-third as long as wide ..... eulophi.

8. Prothorax with strong lateral spines; pubescence above mixed with black; segment 1 distinctly punctured, extreme sides fasciate, 2 fasciate at base and apex; scutel puncto-striate; malar space short ..... armatus.

Prothorax without strong lateral spines; pubescence of thorax above not mixed with black ..... 9.

9. Segment 2 rather coarsely punctured; fasciæ narrow; cell $III_5$ narrowed about one-half above; claws cleft, the divisions nearly equal ..... æstivalis.

Segment 2 minutely punctured, or impunctate; fasciæ broad; cell $III_5$ not so strongly narrowed above ..... 10.

10. Wings whitish; pubescence white; inner claw tooth subapical ..... albescens.

Wings yellowish; inner claw tooth median; hind spur more distinctly pectinate ..... 11.

11. Pubescence ochraceous; cell $III_5$ little longer than $III_4$ .. Americanus.

Pubescence whitish; cell $III_5$ longer than $III_4$; sp. nov ..... similis.

Males.

Antennæ long, joints much longer than wide ..... 4.

Antennæ short, joints shorter, or hardly longer, than wide ..... 1.

1. Joint 3 longer than 5; labrum bituberculate; clypeus convex; pubescence pale; malar space linear; 8 mm ..... brevicornis.

Joint 3 not longer than 5 ..... 2.

2. Posterior face of metathorax coarsely, closely, distinctly punctured; abdomen coarsely punctured; labrum with median fovea; joints of antennæ a little longer than wide; flagellum beneath, tarsi, tibiæ more or less and their spurs, testaceous; malar space linear; 11 mm ..... Robertsonii.

Posterior face of metathorax shining, reticulated, impunctate; abdomen rather finely punctured; malar space more than one-third as long as wide ..... 3.

3. Hind metatarsus about twice as long as broad, with a posterior lobe; clypeus broadly sulcate; labrum striate; front femur with long white hair; thorax above mixed with black; 9–10 mm...latitarsis.
Hind metatarsus about three times as long as broad; 8–9 mm.....Willistonii.
4. Joint 4 shorter than 2–3, not much longer than 3; labrum plane, or with a faint fovea; ventral segments 2–5 strongly bearded laterally; malar space short; thorax above ochraceous; cell $III_5$ short, strongly narrowed above.....æstivalis.
Joint 4 about as long as 2–3.....5.
5. Malar space at least about one-half as long as wide.....8.
Malar space not more than one-third as long as wide.....6.
6. Postscutel with transverse series of subquadrate pits; 9 mm...nudus.
Postscutel densely punctured and pubescent.....7.
7. Mesonotum rather evenly punctured; prothoracic spines indistinct; pubescence ochraceous; 8 mm.....Americanus.
Mesonotum with two densely punctured submedian streaks; prothoracic spines distinct; pubescence griseous or whitish, usually mixed with black on vertex and thorax above; 8–9 mm..armatus.
8. Metathorax with triangular rugose enclosure; maler space as long as wide; pubescence mixed with black above; 9–10 mm..compactus.
Metathorax truncate; with transverse series of subquadrate pits ...9.
9. Pubescence of scutel mixed with black; malar space shorter than wide; 10–12 mm.....inæqualis.
Pubescence of scutel not mixed with black; 7–8 mm.....10.
10. Punctures of mesonotum and scutel about equal in size; malar space shorter than wide; pubescence rather dense, ochraceous..eulophi.
Punctures of mesonotum rather fine and sparse, of scutel very coarse; malar space nearly as long as wide; pubescence thin, griseous.....productus.

*Megachile strophostylis*, sp. nov., ♀.—Black; closely punctured and hardly shining; pubescence rather long and pale; short, thin and black on vertex, mesonotum, scutel, discs of segments 2–5, and base of 6; lateral ocelli about equally distant from vertex and nearest eye; mandibles

with four broad teeth; clypeus short, sparsely punctured, except at base, margin dentate; mesonotum anteriorly with two oblique lines of whitish pubescence; segment 1 short, with a broad concavity, 2–5 with unusually broad fasciæ of pale pubescence; segment 6 very short and broad, a little convex in profile, clothed with long, appressed, glittering, yellowish or whitish pubescence, sometimes blackish at tip; scopa white, a little fuscous on segment 6; hind tibiæ broader than metatarsi; 12–14 mm.; 5 specimens.

In the paper on Sphecodinæ, Ent. News, *14*: 103, Stelidium is a slip of the pen for Sphecodium.

*Andrena polemonii* belongs to Ptilandrena.

## BOOK NOTICE.

INSTINCT AND INTELLIGENCE IN THE ANIMAL KINGDOM.—A Critical Contribution to Modern Animal Psychology, by Eric Wasmann, S. J. (Authorized Translation of the Second and Enlarged Edition).—B. Herder, St. Louis, Mo.

This is a book which ought to be read by every scientist for the clear insight which it gives into the dangers of drawing rash conclusions. Wasmann excels in clearness of thought, but most of all for his insistence upon accuracy in using terms. He gives the clearest definition of "instinct" we have ever met with. It is short, but full: "Instinct is a sensitive impulse to actions that are unconsciously adaptive"; or, more fully, "A sensitive impulse which induces a being to perform certain actions, the suitableness of which is beyond the perception of the agent that performs them," while "intelligence" is the "power of formal conclusion." Again, he says, "there is a power of sensitive cognition which guides instinctive actions belonging to the exterior senses, and there is also an interior sense which perceives the interior state of the agent and feels the pleasant or disagreeable impression which the object of the exterior sense-perception makes upon it; hence we must add the power of sensitive imagination, and a sensile memory which reproduces exterior sense-perceptions and interior sensile feelings, and combine them, one with another, and with new sense-perceptions according to the nature

and laws of sensitive imaginations." Hence, instinctive actions arise when these faculties act to represent as pleasant to an agent what is objectively useful for its preservation, and that of its kind. But "intelligence" combines, with all this, deliberative thought, which takes in every aspect of the case, and draws conclusions of various kinds, both for the present and for the future. Hence, as the result of the study of the actual life and conduct of the creatures other than man, our author contends, and, we think, succeeds in maintaining his contention, that, in the correct sense of the term, those creatures cannot be proved to have "intelligence." He refuses agreement with the modern school of animal psychology on the ground that that school is lax in its use of the term intelligence. Their reasoning is, he thinks, founded on what is termed in logic, "ambiguous middle"; they really use "intelligence" in a double sense. In fact, all attempts to get even the most domesticated animals to "think" have proved abortive. Even Sir John Lubbock's poodle "Van" was a failure. Sir John tried to get his poodle to "read" by having two cards, one inscribed "food," and the other "out," and trained Van to bring the card "food" when hungry, and the other "out" when he wanted a walk. But Van often blundered. Lady Lubbock's lap-dog "Patience," though she had abundant opportunities of seeing the lessons, failed to take them in, nor did Van ever make the least attempt to teach her. There is no proof from even the case of ants that there is more in their actions than can be accounted for by our author's theory when these cases of ant "intelligence" are investigated by really scientific methods and human imagination is not called in to assist deductions.

The attempt, therefore, to prove, as modern animal psychologists try to do, that the intelligence of man differs only in degree, not in kind, from that of the lower creatures cannot be said to be at all established. Man is a thinking creature; he has a spiritual nature, not shared in by creatures lower than himself.

Then as regards "speech"—language—reasoning speech, so to call it, no animals but man have it, nor, in all these years of their existence, have they ever appeared even to seek to acquire it. Speech is the result of human and superior intelligence, and is the vehicle of reasoning thought properly so called.

There is a magnificent chapter on the "different forms of acquiring knowledge," which is, to our mind, one of the best portions of the book.

Another good chapter is that on a "Uniform Standard for Comparative Animal Psychology."

We would earnestly commend to all scientists a careful study of Chap. VII., Bk. V., in Mills' Logic, "on Fallacies of Confusion," as most useful to them in building up their theories. It has always appeared to us that modern animal psychologists are faithless to their theory of evolution. Evolution teaches us that there is an ever upward step in the succession of being; hence we should expect that this would take place in the case of man, the present culmination of all previous evolutions of being. This, Revelation makes known. Creatures below man have had evolved for them, in rising degrees, a sensitive soul, that can direct them to act suitably to their needs for obtaining good and avoiding harm. The next step would be the "evolution," so to call it, of a creature that would add intelligent reasoning, and a deeper insight into the true nature and reason of things; a being that would more nearly, in this and other ways, e. g., the moral sense of right and wrong, approach the character of the Great Author and Ruler of all. Man is clearly seen to surpass other creatures, especially in this last respect. Man has a conscience as regards, if we call it so, the abstract nature of good and evil as principles of conduct, not merely of expediency. The best of men in all ages have felt that they were not mere clods of the valley, but had a future. Revelation explains this by letting us know that that which differentiates man is his threefold nature; his highest constituent being his spirit, in which reside and act his intellectual and reasoning powers properly so called. Science, if it does not attempt to go beyond its province by calling in imagination to its aid, will find itself stopped at a certain point. If it assures us that acts and thoughts are the results of motion, or change, in the brain cells, it cannot tell us what that mysterious thing is that connects will, or thought, with that motion or change. Why not, then, accept the explanation afforded by Revelation? It is answered: Revelation does not clear up the mystery. No more it does; but it gives us the information that man has a nature not wholly common to other creatures, but is possessed of a constituent that enables him to see, more and more, into deep things and thoughts, and the next step higher will be when the new man "Shall know even as he is known." W. E. COOPER.

Mailed September 1st, 1904.

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## EXCHANGE.

*Subscribers are invited to make liberal use of this column. Notices over three lines are liable to be shortened if necessary. All insertions free to subscribers.*

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# The Canadian Entomologist.

VOL. XXXVI. LONDON, DECEMBER, 1904. No. 12

## NOTES ON THE LOCUSTIDÆ OF ONTARIO.

BY E. M. WALKER, B. A., M. B., TORONTO.

(Continued from page 330.)

### Sub-family *CONOCEPHALINÆ*.

7. CONOCEPHALUS ENSIGER, Harris. The Sword-bearer.

*Conocephalus ensiger*, Harr. Ins. Inj. Veg., 1862, 163.

Measurements: Length of body, ♂ 26.5 mm., ♀ 29 mm.; of pronotum, ♂ 7.5 mm.; ♀ 6.7 mm.; of hind femora, ♂ 20.5 mm., ♀ 21.5 mm.; of tegmina, ♂ 41 mm., ♀ 46 mm.; of ovipositor, 32 mm.

This is a very common insect in Ontario, ranging northward about as far as Muskoka and the Bruce Peninsula. It frequents fields, vacant lots and roadsides, which resound at night with the incessant monotonous song, during late summer and autumn.

Scudder describes this song as composed of a succession of sounds like "*chwi*," emitted at the rate of about five per second. He states that it stridulates only at night or during cloudy weather, but I have occasionally heard it in bright sunshine, in the afternoon. It is the most easily approached of all our locustarians while thus engaged, and is in fact difficult to find in any other way; hence the females are but seldom seen.

Although this grasshopper usually perches upon tall weeds, I have occasionally traced its song to a tree or vine, the insect being sometimes stationed at a considerable height.

I have taken but one brown individual, a female captured at Toronto, Oct. 1, 1893.

Localities: Rondeau, Kent Co., Sept. 14, 1899; Leamington, Aug. 7, 1901; Sarnia, Aug. 16, 1901; Goderich, Aug. 19, 1901; Burke Id., Lake Huron, Aug. 27, 1901; Niagara River, Sept. 26, 1898; Toronto, Aug.–Nov.; Lake Simcoe, Aug.–Sept.; Bracebridge, Muskoka (heard), Sept. 11, 1900.

8. CONOCEPHALUS NEBRASCENSIS, Bruner. The Nebraska Conehead.

*Conocephalus Nebrascensis*, Bruner, CAN. ENT., XXIII., 1891, 72.

Measurements of ♂: Length of body, 25 mm.; of pronotum, 6.7 mm.; of hind femora, 19 mm.; of tegmina, 34 mm.

I found four males of this species at Sarnia, on the 12th of August, 1901, by tracing the song to its source. The song was a loud, penetrating, continuous whirr, quite suggestive of the dog-day Cicada, but less clear, and very unlike that of *ensiger*. It was heard in the morning during bright sunlight.

The specimens were taken in a large stretch of open grassy marsh land, bordering the St. Clair River. Earlier in the season this area of land had been entirely covered by water, but the ground was dry when I visited the spot.

9. XIPHIDIUM FASCIATUM, De Geer. The Slender Meadow Grasshopper.

*Locusta fasciata*, De G., Mem. pour serv. à l'hist. des ins., III., 1778, 458.

*Xiphidium fasciatum*, Burm., Handb. der Ent., II., 1839, 708.

Measurements: Length of body, ♂ ♀ 12.5 mm.; of pronotum, ♂ 2.75 mm.; ♀ 2.8 mm.; of hind femora, ♂ 11 mm., ♀ 11.5 mm.; of tegmina, ♂ 14 mm., ♀ 15 mm.; of ovipositor, 8.4 mm.

This is much the most abundant locustid found in Ontario, and is common in every part where I have made collections of Orthoptera. It is especially numerous in low damp pastures, timothy and clover meadows.

My earliest captures are dated July 25th, but the imagoes usually appear rather before this. They remain until the beginning of October.

The song of the male is somewhat like a faint echo of that of *Orchelimum vulgare*, but the "*zip*" is emitted only once or twice at a time, and at shorter intervals, "*xr..... zip, zip, xr.....*"

*Fasciatum* is one of the few common locustids in northern Ontario. It is as abundant at North Bay, Lake Nipissing, as at Point Pelee, and south of the boundary line its range extends to Buenos Ayres, S. A.

Localities: Ottawa; Ont., generally to north of Lake Superior (Caulf.); Point Pelee and Leamington, Aug. 8, 1901; Arner, Essex Co., Aug. 9, 1901: Rondeau, Sept. 14, 1899; Chatham, Aug. 10, 1901; Sarnia, Aug. 12, 14, 1901; Walpole Id., River St Clair, Aug. 13, 1901; Goderich, Aug. 19, 1901; Southampton, Aug. 22, 29, 1901; Bruce Peninsula, Aug. 23, 27, 1901; Toronto, Aug.–Oct.; Lake Simcoe, July 26–Oct; Severn River, Aug. 17, 1898; near Gravenhurst, Aug. 27, 1899; Algonquin Park, Aug., Sept., 1902, '03; North Bay, Sept. 12, 1900; Whitemouth, north shore of Lake Superior, Aug. 28, 1897.

Outside of Ontario I have taken this species at Quebec and the Isle d'Orleans, P. Q.; Aug., Sept, 1904; Boissevain, Man., Sept. 24, 1897; and at Agassiz, B. C., Sept. 9, 1897.

10. XIPHIDIUM BREVIPENNE, Scudd. The Short-winged Meadow Grasshopper.

*Xiphidium brevipenne*, Scudd., Can. Nat., VII., 1862, 285.

Measurements: Length of body, ♂ 12 mm., ♀ 13 mm.; of pronotum, ♂ 2.75 mm., ♀ 3.25 mm.; of hind femora, ♂ 10.3 mm., ♀ 11.7 mm.; of ovipositor, 9.75 mm.

This is another abundant species in Ontario, and is found in the same places as *X. fasciatum*.

It first reaches maturity about the first week in August, and remains well into October.

Although nearly as common as *X. fasciatum* in southern Ontario, *brevipenne* becomes scarcer to the north of Muskoka. It was not very common in Algonquin Park, where it seems to prefer the vicinity of rank herbs and bushes in more or less shady spots; while at North Bay I did not come across it at all. It was also quite rare on the Bruce Peninsula. On the other hand, I found it very abundant on the Isle of Orleans and surrounding parts of the Province of Quebec, *fasciatum* being comparatively scarce there.

The note of the male is very like that of *fasciatum*. The *zips* are emitted at intervals of about one second, one or two being produced at a time.

I have a long-winged female of a *Xiphidium* taken at Rondeau, Sept. 15, 1899, which possibly belongs to this species. It is considerably larger than typical *fasciatum*, with a distinctly longer ovipositor. In the length and shape of the ovipositor, it is very like *ensiferum*, but the head and pronotum are narrower than in that species. It measures as follows: Length of body, 15 mm.; of pronotum, 3 mm.; of hind femora, 13 mm.; of tegmina, 8 mm.; of ovipositor, 12.3 mm.

Localities: Arner, Essex Co., Aug. 9, 1901; Rondeau, Sept. 14, 1899; Sarnia, Aug. 12, 1901; Walpole Id., River St. Clair, Aug. 13, 1901; Goderich, Aug. 19, 1901; Southampton, Aug. 22, 1901; Tobermory, Bruce Co., Aug. 26, 1901 (one seen); Burke Id., Lake Huron, Aug. 27, 1901; Owen Sound, Aug. 31, 1901; Toronto, Aug. 4–Oct.; Lake Simcoe, Aug. 5 to Oct.; Severn River, Aug. 17, 1898. Six-mile Lake, Muskoka, Aug. 24, 1898; Dwight, Northern Muskoka, Sept. 2, 1902; Algonquin Park, Aug., '02, '03.

11. XIPHIDIUM SALTANS, Scudd.

*Xiphidium saltans*, Scudd., Rep. U. S. Geol. Surv., Nebr., 1871, 249.

*Xiphidium modestum*, Brun., CAN. ENT., XXIII., 1891, 56.

Measurements: Length of body, ♂ 11 mm.; ♀ 12 mm.; of pronotum, ♂ 2.8 mm., ♀ 3 mm.; of hind femora, ♂ ♀ 10 mm.; of tegmina (short-winged form), ♂ 4 mm.; ♀ 2.4 mm.; of ovipositor, 10.6 mm. Long-winged form: Length of tegmina, ♂ 14 mm.; ♀ 14.6 mm.; of wings, ♂ 16.2 mm., ♀ 17 mm.

I have found this western species in but one locality, High Park, Toronto, where it occurs locally in considerable numbers in the open grassy uplands, on sandy soil. These sandy uplands are of a very interesting character, and support a number of unusual plants and insects. Among the latter, *Melanoplus Dawsoni*, another western grasshopper, is found in the same spots as *X. saltans*. Both of these species are characteristic of the Western prairies, the general range of *saltans*, as given in Scudder's "Catalogue of the Orthoptera of the United States and Canada," being from the Rocky Mts. to the Mississippi River. It is found in the western part of Indiana, and has been reported from New Jersey (Smith, Ins N. J., 1900, 162).

*X. saltans* is most plentiful in tufts of rather long grass. New Jersey Tea, Sweet-fern and Lupine are among the characteristic plants of the locality.

My specimens are all peculiar in their coloration, being of a pale, almost bluish green, instead of dull reddish brown, the usual colour according to the descriptions. The dark stripe on the top of the head and pronotum is margined on either side by a very distinct and rather broad yellowish line.

A pair of this species was submitted to Prof. Morse, and another to Prof. Blatchley, both of whom agree in confirming my determination.

On the 9th of August, 1903, I captured a pair of long-winged individuals. These are the first that have been taken. They were found in company with short-winged examples, and are recognizable as *saltans* at a glance from the small size, peculiar coloration and long ovipositor in the female.

My specimens are dated Aug. 9, 10, 1902, and Aug. 9, Sept. 8, 20, 1903.

12. XIPHIDIUM NIGROPLEURA, Bruner. The Black-sided Meadow Grasshopper.

*Xiphidium nigropleurum*, Brun., CAN. ENT., XXIII., 1891, 58.

*Xiphidium nigropleura*, Scudd., CAN. ENT., XXX., 1898, 184.

Measurements: Length of body, ♂ 19.3 mm., ♀ 14.6 mm.; of pronotum, ♂ 3.3 mm., ♀ 3.5 mm.; of hind femora, ♂ 13 mm., ♀ 13.8 mm.; of ovipositor, 17.5 mm.

I have come across this handsome species in small numbers in southern Ontario, where it frequents open marshes bordering creeks and ponds, and grown up with tall grasses, sedge, etc. It was generally found in company with the next species. But a single male was taken.

Localities: Rondeau, Sept. 14, 1899; Arner, Aug. 9, 1901; Chatham, Aug. 10, 1901; Walpole Id., River St. Clair, Aug. 13, 1901.

13. XIPHIDIUM ATTENUATUM, Scudd. The Lance-tailed Meadow Grasshopper.

*Xiphidium attenuatum*, Scudd., Trans. Amer. Ent. Soc., II., 1869, 305.

*Xiphidium Scudderi*, Bl., CAN. ENT., XXIV., 1892, 26.

Measurements: Length of body, ♂ 12 mm., ♀ 14 mm.; of pronotum, ♂ 2.6 mm., ♀ 2.9 mm.; of hind femora, ♂ 11 mm., ♀ 14.2 mm.; of tegmina, short-winged form, ♂ 9.5 mm, ♀ 8.5 mm.; long-winged form, ♂ 16.5 mm.; ♀ 19 mm.; of ovipositor, 20–30 mm.

This extraordinary insect is plentiful in southern Ontario, but is quite limited in distribution.

The females are easily known by the enormous development of the ovipositor.

It frequents open marshy borders of creeks and ponds, where it leaps about with wonderful agility among the tall grasses and sedge. The short-winged form is much more often seen than the long.

Blatchley says: "The eggs of *attenuatum*, as the length of the ovipositor indicates, are laid between the stems and leaves of tall rank grasses, among which the insects live."

Localities: Rondeau, Sept. 15, 1899; Point Pelee, Aug. 8, 1901; Walpole Id., River St. Clair, Aug. 13, 1901.

(To be continued.)

## A REVIEW OF OUR GEOMETRID CLASSIFICATION—No. 2.

BY RICHARD F. PEARSALL, BROOKLYN, N. Y.

In my former paper a preliminary discussion of certain genera in Geometridæ made plain the need for a general rearrangement of this group. But this cannot be done as regards all of the species without much close study and comparison of types. Therefore, I venture at this time only to outline what seems to me the most rational method of arrangement into sub-families and genera—to include new material and to correct many errors in definition, and in some cases identification of generic types, as given by Dr. Hulst (Trans. Am. Ent. Soc., xxiii., 245, 1896). I claim nothing original in my work, for I consider the general scheme, as devised by Dr. Hulst, the best that can be produced, nor do I need to add to his introduction of it, as given in the article referred to, except to say that I am strongly in accord with him when he states that this family are most nearly related to the Noctuidæ. In my arrangement of genera I place, therefore, *Paleacrita* at the head of the series.

Following largely the characterization as given by Dr. Hulst, they separate thus:

*Geometrina.*

Synopsis of families and sub-families.

Hind wings, vein 5 present, strong.....Geometridæ.
Hind wings, vein 5 absent, or a fold only.....Ennomidæ.

Geometridæ.

1. Antennæ ♂ unipectinate .....Monotaxinæ.
   Antennæ ♂ not unipectinate.....2.
2. All wings with vein 5 nearer 6 than 4 .....Geometrinæ.
   Fore or hind wings with vein 5 at middle of cell or nearer 4 than 6..3.
3. Hind wings, vein 8 coalescing with cell to middle, or if separate, joined with it by a cross-bar, at or beyond middle.....Hydriominæ.
   Hind wings, vein 8 separate from cell, or joined at or near base only.4.
4. Hind wings, 8 shortly joined with cell at or near base.....5.
   Hind wings, 8 separate from cell .....Brephinæ.
5. Hind wings, 8 joined with cell near base, shortly then rapidly diverging.....Sterrhinæ.
   Hind wings, 8 joined with cell at base, then subparallel with it .....Monocteniinæ.

Ennomidæ.

1. Hind wings, 8 coalescing with cell at base.....Fernaldellinæ.
   Hind wings, 8 separate from cell.....2.
2. Frenulum absent.....Palyadinæ.
   Frenulum present.....3.
3. Antennæ nearly joined at base.....Sphecetodinæ.
   Antennæ normally placed.....4.
4. Antennæ three-fourths length of fore wings; legs very long.....Mecoceratinæ.
   Antennæ never more than two-thirds length of fore wing; legs normal.....5.
5. Fore wings, 7 separate from 8 and 9.....Melanchroiinæ
   Fore wings, 7 stemmed with 8 and 9.....Ennominæ.

From this group is excluded the sub-family of Strophidiinæ, now constituting the family Epiplemidæ. They are sufficiently removed from the typical forms of Geometridæ to warrant this perhaps, by the want of humeral angle at the base of vein 9 on the hind wings, and, in the case of Callizzia, by the broadening of the inner margin of the hind wings, which, when the insect is at rest, is rolled round the body, in the manner of the Tineoidea, the upper half overlapping it, while the fore wings are extended at right angles, as in most Geometridæ.

Starting with the sub-family of Hydriominæ, I have amalgamated with it the Dyspteridinæ, a sub-family established by Dr. Hulst, upon the supposed absence of the frenulum, in certain species. Finding that this appears to be constant in only two of his species, and that in the Ennomidæ the same feature occurs, I have determined to abandon its use, as showing when absent merely a tendency toward degeneration (as in the Sterrhinæ and Geometrinæ, by the partial obsolescence of the hind legs), and not worthy of basic consideration.

The Brephinæ find a final resting place at the close of the family of Geometridæ, for by the presence of vein 5 in the hind wings they belong with this series, and the presence of hair pencil on hind tibiæ of ♂ in *Brephos infans* (an observation I have not seen recorded) fixes beyond further question their family relationship.

The Ennominæ remain an unwieldly mass, but afford no characters which I can detect, that are stable enough to warrant more than generic separation.

Hydriominæ.

Beginning with Paleacrita, the genera can be arranged in a sequence which is natural both as to structure and venation. The wingless female gradually develops into one fitted for flight, while the male degenerates in alar expanse, especially on the hind wings, the series reaching a full development in both sexes as it progresses. A synopsis of the genera will be given at the close of my work on each sub-family.

I have dropped both Cysteopteryx and Agia, genera founded by Dr. Hulst, the former upon a variety of *Nyctobia limitata*, and the latter on a species previously described by Dr. Packard as *Lobophora viridata*. Dr. Packard's species, however, is not a true Lobophora, but belongs under Nyctobia.

The genus Talledega, founded by Dr. Hulst, falls because the type *montanata*, Pack., is a true Lobophora, Curt. The supposed absence of hair pencil on the male, by which Dr. Hulst separated it, is an error. It is present and very conspicuous, but lies in a cavity between the thorax and abdomen beneath. Probably Dr. Hulst looked for the sheath or groove in hind tibia, where it usually rests, and finding none, supposed the hair pencil was wanting.

The genus Opheroptera, Hub., should be dropped, the only species under it, *O. boreata*, having been very doubtfully catalogued by Staudinger, from Greenland, many years ago.

(To be continued.)

## CORRECTION.

In the November number of this Journal, page 333, Dr. Ashmead has described a parasite of the Grape-berry moth, giving the scientific name of the moth as *Eudemis bortana*. The specific name should be *botrana*. This European name has been applied to the American Grape-berry moth by all writers since 1870, but as Mr. W. D. Kearfott and myself have just demonstrated in Bulletin 223 from the Cornell Agricultural Experiment Station, and also in the Transactions of the American Entomological Society for December, 1904, the American insect is specifically distinct and easily separated from the European Grape-berry moth. We find that the American Grape-berry moth should bear the name of *Polychrosis viteana*, Clemens. The European *Eudemis botrana* is not known to occur in this country, and the parasite was bred from the American species, so the title of Dr. Ashmead's description should be corrected to include the American name of the Grape-berry moth and not the European.

M. V. SLINGERLAND.

# PRELIMINARY LIST OF THE MACRO-LEPIDOPTERA OF ALBERTA, N.-W. T.

BY F. H. WOLLEY DOD, MILLARVILLE, ALTA.

(Continued from Vol. XXXIII., p. 172.)

It is now over three years since I published a list of Albertan butterflies under the above title. The list gave promise "to be continued," and it was fully intended at the time to publish the continuation the same year, but for a variety of reasons it had to be postponed. The delay, however, has not been without advantages. Not only have a number of species come to hand that had not been recorded here up to that time, but many that were then standing under names by which I had known them for years, have been found to be wrongly named, and several of them have been described as new species. Closer study, too, of long series, has resulted in a better understanding of nearly allied forms; and it is hoped that some of the notes here appended, though they have no claim to perfection, will enable some obscure species to be more easily separated than they have been hitherto. At the same time, I much regret that I have not been able to make more comparison of local material with that from other districts. Not only has it been hard to spare the time which much exchanging calls for, but it has often proved a very difficult, if not impossible matter, to get by exchange some of the commonest species, their very commonness seeming to render them, so to speak, scarce, at least in collections. I hope, however, to pay more attention to exchange in the future, and when more forms from other localities have come to hand the result of their study, and comparison with their Alberta representatives will probably be published from time to time.

Of the radical changes that have taken place in classification since my list of butterflies was published, enough has been said. Of the two recently published North American lists, I have preferred to follow that of Prof. Smith, as it seems to me to give a better arrangement of the Noctuidæ, or at least of the species in their respective families, and it is the Noctuidæ that have always been my favourite group. Though I am doubtful as to whether the term is any longer recognized, or if so, just where the line is drawn, I have included all the old-time "Macros," meaning thereby those genera which used to be known in European lists fifteen years ago as Sphinges, Bombyces, Geometræ, Cuspidatæ, and Noctuæ. Though I still study them as with the "larger fry," the Hepialidæ at any rate have been eliminated from their former position, as

have also the Cossidæ, and of the impending removal of the latter to the "Micros," it is quite fifteen years since I first heard the suggestion. In the present list I have attempted considerably more in the way of study than I did in the butterflies. I have made more comparisons and exchanged a far greater amount of correspondence. In one instance, that of Cosmia, I have taken the liberty of differing from the authors of all our recognized standard works, and believe a revision of the synonymy, by someone who has seen the types of Grote and Walker, to be necessary. This decision is only after a close inquiry into the matter, a study of a considerable quantity of material from the old world as well as from the new, and correspondence with several specialists who were able to give me information on the subject. It may be, however, that in this, as well as in other points concerning identity, I have come rather too hastily to conclusions. I am indebted to Prof. J. B. Smith and Drs. Ottolengui and Dyar for the names of my Sphinges, Bombyces, Notodontidæ, and a few other families allied thereto. The list of these is not a long one, but I am rather inclined to think that their apparent scarcity may be due to the fact that, in this district at any rate, they are of quiet and retiring habits, and do not often show up. It is to the Noctuidæ that most attention has always been paid, and Prof. Smith has been unceasing in his assistance to me in this group. I am also most fortunate in being in correspondence with Sir George Hampson, of the British Museum, where, of course, a very large number of types are to be seen, and the sending to him of a number of species, with the names by which I have known them, has resulted in the detection of many errors which would probably have otherwise still been overlooked. The first instalment of the Noctuidæ has quite recently been published in Vol. IV. of his "Catalogue of the Lepidoptera Phalænæ in the British Museum," and as a very large number of North American species are therein figured, many of them for the first time, it proves a valuable aid in the determination of species. Dr. Holland's "Moth Book," too, has supplied a long-felt want. In all works of the above kind, however, the practice of sometimes figuring the male of one species and the female of another very closely allied to it, is rather to be deprecated, as it is apt to give the impression that a merely sexual difference is really specific, there not unfrequently being less difference in facies between two species in the same sex than there is between the two sexes of either. It must be borne in mind that in making comparisons between closely allied species, my opinions are based on superficial characters, and I have almost com-

pletely ignored genitalic differences claimed by Prof. Smith. It is, I think, for superficial characters that most of us naturally look, and though the "genitalia test" is doubtless of the highest value as an aid, I am not aware that its infallibility is an accepted fact. I have not, however, studied the matter, and am quite willing to accept it at its estimated worth. The genus Euxoa is perhaps the most difficult in all the Noctuidæ to understand. Species run so very close together, and vary so tremendously *inter se* that it is often almost impossible to tell where one ends and another begins. It is probable that many groups in this genus will never really be made much of without careful breeding from known females. The matter is intricate enough in dealing only with material from one locality, but when geographical variation has to be taken into account, I believe there is hardly a genus in all the Lepidoptera in which species are harder to define. In the Noctuidæ I have given references to all published figures of western species known to me elsewhere than in the works of Dr. Holland and Sir George Hampson.

Unfortunately, not much attention has as yet been paid to the Geometridæ in this district. But though for that reason records have not been very carefully kept, the notes and dates given, as far as they go, have been very carefully prepared, and may be relied upon as being tolerably accurate. The Rev. G. W. Taylor has recently commenced a special study of the whole group, and through his kindness at least half of those here listed are now named, which could not have been named three years ago owing to there then being no one working on them that I knew of. Amongst those that I had at that time named, it turns out that the late Dr. Hulst had made several peculiar errors. The names I now give are all on the authority of Mr. Taylor, and the (??) are his also.

It is often a difficult matter to decide whether to put down a species as "common" or "rare." The majority of species seem to have their special seasons or series of seasons; and favourable or unfavourable conditions for existence seem sometimes to show their effects on an entire genus. Almost every year something or other turns up in some numbers that has always been considered a great rarity, or else never before been met with at all, and *vice versa*. Every moth-collector of experience must know, too, how sometimes a species shows up rather freely for one or two nights only, though to all appearance on the preceding and succeeding nights the conditions are practically the same.

All captures, unless otherwise expressly stated, refer to the district near the head of Pine Creek, about eighteen miles south-west of Calgary.

The "Billings's mill" locality, ten miles further west, in the spruce timber, has been described in my preface to the butterflies. "Blackfalds" is, I believe, intended to refer to the same general locality as "Lacombe" in the butterflies. A type specimen referred to as "at Washington," means that it is in the U. S. National Museum at that place, and "at Rutgers College" signifies Prof. J. B. Smith's collection. It has been a common error in the past amongst describers of species to record a large percentage of material taken on British territory, between Winnipeg and the Pacific, as coming from "B. C." Incidentally, the geographical error is not confined to entomologists, as "B. C." is erroneously engraved upon the door-key tags, menus, etc., at the C. P. R. chalet at Laggan. The eastern boundary of British Columbia is, I believe, the summit of the Rocky Mountains, 5 or 6 miles west of Laggan. In one instance among the many corrections of the error that I have made in this paper, the actual locality mentioned (Roundthwaite) as being in "B. C." is actually about 650 miles distant therefrom as the crow flies. There are several types referred to "B. C." which I rather suspect of coming from Manitoba or the North-west Territories, though I am quite unable to trace them.

SPHINGIDÆ.

95. *Hemaris diffinis*, Bdv.—Common at flowers of wild gooseberry. End May and June. Larva on snowberry.

96. *Lepisesia flavofasciata*, Walk.—One fine ♀ near Billings's lumber mill, June 5th, 1898.

97. *Deilephila galii*, Rott., var. *chamænerii*, Harr.—Common at flowers of bergamot, wild gooseberry, etc., at dusk. June and July.

98. *D. lineata*, Fabr.—Rather rare at cultivated "pinks" and other flowers at dusk. My specimens are all from near mouth of Fish Creek. I think I have seen it on the hill prairie occasionally. July.

99. *Sphinx Vancouverensis*, Hy. Edw., var. *albescens*, Tepper.—Not rare, flying at dusk, or at rest in daytime. June and July.

100. *Smerinthus Jamaicensis*, Dru., var. *geminatus*, Say.—Rather common flying round willow bushes after dark, and at light. June and July.

101. *S. cerysii*, Kirby.—Not at all common. Same method of capture as preceding species. June.

SATURNIIDÆ.

102. *Samia Columbia*, Smith.—Probably fairly common, but it seems to me to be more of a prairie than a foothill species. I have only 4 ♂

specimens taken at light, one of which has been labelled *Columbia* by Prof. Smith. They agree pretty well with the figure of that species in Dr. Holland's book, but lack the reddish shading of the outer band there shown, which shading, as mentioned in the text, is supposed to be characteristic of *Gloveri*. I cannot, however, detect it in his figure of the latter species. I have a pair sent me from the States, but without data, labelled *Gloveri*, which have certainly a very faint purplish shading in outer band, but the central band has less of a purplish tint, and in this respect they are quite unlike Dr. Holland's figure of *Gloveri*. The specimens are a good deal larger than mine, but otherwise their distinctness does not satisfy me. However, comparison with specimens from an unknown locality is eminently unsatisfactory. I have occasionally found empty cocoons of a *Samia* on Salix near the head of Pine Creek (*i. e.*, in the hills), but never with larvæ, and rarely with imagines. It is rather more common about ten miles further east, near the mouth of Fish Creek, but the only time I tried "assembling" with a ♀ there I met with no success, probably through ignorance of the correct time for flight. It is a fairly regular, though not common, visitor to the Calgary electric lights, and I have occasionally been brought specimens taken in houses in the town.

During a trip made down the north bank of the Bow River in 1899, I noticed larvæ that I took to be *Columbia* common in some spots on osier growing on the river banks. Dr. Fletcher has bred moths from larvæ from the Lacombe district which he tells me are "more like *Gloveri* than my conception of *Columbia*." He reports that the larvæ at Lacombe feed on *Elæagnus argentæa*, but I have never observed them on that shrub myself.

SYNTOMIDÆ.

103. *Scepsis fulvicollis*, Hbn.—A single specimen at head of Pine Creek, flying in sunshine, July 25th, 1898, and another on Red Deer River bottom at snowberry flowers, in sunshine, about July 7th, 1904.

LITHOSIIDÆ.

104. *Crambidia casta*.—Not rare at light. Middle Aug. to middle Sept.

105. *Hypoprepia miniata*, Kirby.—Two specimens only, a ♀, Blackfalds (near Lacombe), Alta., Aug. 1st, 1902 (Gregson), and a ♂, head of Pine Creek, July 25th, 1903, at light, the latter named by Dr. Dyar. Both are quite fresh specimens.

NOLIDÆ.

106. *Celama pustulata*, Walk.—Not rare, at light and dusk. July.

ARCTIIDÆ.

107. *Eubaphe aurantiaca*, Hbn., var. *rubicundaria*, Hbn.—Common flying in sunshine. End of June and July. I have only seen a single ♀.

108. *Dodia Albertæ*, Dyar.—Described from Calgary. Probably not rare in the spruce some seasons, though I have only taken two specimens from near Billings's lumber mill in early July. These are the diaphanous gray form referred to in the description. A third, taken at head of Pine Creek on June 11h, 1900, by Mr. Hudson, is the specimen there mentioned as being washed with white, and which I had looked upon as a distinct species. Type 5747, U. S. Nat. Mus., has been divided. The left wings are in the National collection mounted on a slide, and the rest of the specimen is in my own collection. Though I have looked out for it, I have not met with the species since 1900. At rest it resembles Eubaphe in form.

109. *Estigmene acræa*, Dru.—Common in the town of Calgary, and probably on the prairies eastward. A few specimens were taken at head of Pine Creek during 1903, but as the species had not been observed there previously, they may have been the progeny of live ♀ ♀ brought by Mr. Hudson or myself from the town. June.

110. *Neoarctia Beanii*, Neum., Laggan (Bean).—Described from there, I believe. I have a single specimen from Mr. Bean, July 9th, 1900, bred from larva on willow; var. *fuscosa*, Neum., is from the same locality.

111. *N. yarrowi*, Stretch.—A single specimen was taken on Aug. 18th, 1902, on the bare summit of Mt. Niblock., near Lake Agnes, Laggan, at an altitude of about 8,000 feet, by Dr. Wm. Barnes.

112. *Phragmatobia fuliginosa*, Linn.—A single ♀ flying in sunshine, May 27th, 1894.

113. *Arctia caja*, Schrank., var. *Wiskotti*, Staud.—Mr. Sanson records "var. *Utahensis*" from Banff. The name stands in the latest lists as a synonym of *Wiskotti*.

114. *Hyphoraia lapponica*, Thunb.—Occasionally in the hills at light, rest, or flying in sunshine. Fairly common during 1902, and at dusk in 1904. Middle June and July.

115. *Apantesis virgo*, L.—A single ♂ taken at light, July 22nd, 1903, is apparently typical. A pair from Blackfalds, July 1st and 2nd, 1902, have, Mr. Gibson tells me, the markings on secondaries much heavier than in the eastern form. These are the only Albertan specimens I have seen. Mr. Gregson reported the larvæ of this species to be abundant at Blackfalds during 1903. Mr. Arthur Gibson records the species from Edmonton, in Northern Alberta.

116. *A. virguncula*, Kirby.—Two ♂ ♂ and a ♀ are all the specimens I have ever seen here. They were taken in different years. End of June and July.

117. *A. michabo*, Grt.—A single ♀, at rest, June 9th, 1893.

118. *A. parthenice*, Kirby.—Not common at light in some seasons. The only ♀ ♀ I have taken have been bred from larvæ picked up haphazard. Middle July to middle August. The secondaries of the ♀ are of a much deeper red than in the ♂, and in one specimen the white markings on primaries have a very decided reddish tinge.

119. *A. oithona*, Strk., var. *rectilinea*, French.—Recorded from Calgary by Mr. Willing, on the authority of Mr. Gibson.

120. *A. Queneliti*, Payk., var. *turbans*, Christoph.—This species, which formerly passed as a miniature *virguncula*, used to be very common, more especially east of the hills, eight or ten years ago. The larvæ, which fed on Galium, might then be captured in some numbers in holes dug for fence posts, and left open for twelve hours or so. Of late years it has been far less common, but has come occasionally to light. None of my specimens have the orange secondaries mentioned by Mr. Gibson in his paper on this genus (CAN. ENT., XXXV., 144).

121. *A. obliterata*, Stretch.—A single male, at light, head of Pine Creek, Aug. 15th, 1901. This, which I believe is the only specimen of the form known, is referred to in CAN. ENT., XXXV., 144, and figured on Pl. 5 of that vol. It is still in my collection. It differs from any of my *turbans* in having rich orange secondaries instead of yellow, two additional discal spots, and a dark dash near and parallel to the inner margin. I never suspected it of being distinct from *turbans* until Mr. Gibson's paper was published, and fancy it will eventually prove to be but a variety of that species.

122. *A. Bolanderi*, Stretch?—Mr. Gibson referred a ♂ (May 24th, 1897) and three ♀ ♀ doubtfully to this form, which Dr. Dyar treats as a synonym of *Blakei*. I have a similar ♂ dated June 3rd, 1903, and a third has been taken during June of the present year. Two of my ♀ ♀ I have always taken to be *determinata*. The other ♀ and the ♂ ♂ I have been inclined to consider distinct, on account of the much earlier date, lighter build, less hairy vestiture, and greater intensity of black on primaries. I have *Blakei* from Colorado, which at any rate can hardly be the same species as mine, from which it differs in being a stouter insect, broader winged, with more hairy thoracic vestiture, having four transverse bands

on primaries instead of two, longer and rather more heavily pectinated antennæ, and much less black on secondaries. Of my ♂ Mr. Gibson said, "May be *Bolanderi*, but may simply be a variety of *determinata*." I hardly think it is the latter.

123. *A. Nevadensis*, G. & R., var. *incorrupta*, Hy. Edw.—So far I have only taken two ♂ ♂ and two ♀ ♀, July 7th to Aug. 6th. The ♂ ♂, on Aug. 6th, were taken at Calgary town lights. A third ♀, June 28th, 1899, has primaries marked as *incorrupta*, but has pure black secondaries and a black body. I have two ♀ *Nevadensis* from Glenwood Springs, Colo., which look quite a different species. In fact, they come very much nearer to *Blakei*, from the same locality, than to Calgary *incorrupta*, specimens of which have been seen by both Dr. Dyar and Mr. Gibson.

124. *A. Williamsii*, Dodge, var. *determinata*, Neum.—Common. End of June and July. In one specimen there is no trace of the 3rd transverse band (= typical *Williamsii* ?), and the 4th and W marks are very faint. I have no ♀ ♀, unless those mentioned above under *Bolanderi* belong to this species. The ♂ antennæ are sometimes variegated, black and cream.

125. *A. celia*, Saund.—Banff, June 16th (Sanson). On the authority of Mr. Gibson. I have never to my knowledge seen a specimen.

126. *A. sp.*—A series of nine specimens have been a puzzle alike to Mr. Gibson and Dr. Dyar. Seven ♂ ♂ and one ♀ were taken near Billings's lumber mill on June 19th and 26th, 1898, and a ♀ is from Blackfalds, taken by Mr. Gregson on Aug. 9th, 1902. I believe the series to represent one extremely variable species. Four ♂ ♂ somewhat resemble *Williamsii* in maculation, but are smaller and much blacker. Two ♂ ♂ and two ♀ ♀ are like miniature *virguncula*. I have not taken the species for several seasons.

127. *Parasemia plantaginis*, Linn.—Not common on creek bottoms on the hill-prairie. Common in the spruce and westward to the mountains. End June and July. I have specimens like all the varieties listed in Dyar's and Smith's lists except *Geddesi*. An interesting article on Laggan *petrosa*, by Mr. Bean, will be found in CAN. ENT., XXVII., 87, and Fl. II.

128. *Halisidota maculata*, Harr.—A single ♂ at light, June 25th, 1898, was all I ever saw of this species until last year (1903), when I found the decidedly conspicuous larvæ common on different species of poplars in gardens in Calgary. These pupated in September, and moths emerged in the house at the end of February of the present year.

PERICOPIDÆ.

129. *Gnophæla latipennis*, Bdv., var. *vermiculata*, G. & R.—A single specimen at Lacombe, July 27th, 1900, in sunshine, on a flower head (P. B. Gregson). I have seen the specimen. The name is on the authority of Dr. Fletcher, who says that the species has never before been recorded north of Colorado.

AGARISTIDÆ.

130. *Androloma MacCullochii*, Kirby.—Rare near Calgary, probably more common in the mountains. June 19th (worn), Billings's lumber mill; Laggan (fresh), July 17th to 25th; and (worn) Aug. 8th. Taken flying in sunshine.

131. *Alypia Langtonii*, Couper.—Common in the spruce, less so in the poplar woods on Pine Creek. End May and June.

NOCTUIDÆ.

132. *Acronycta Canadensis*, Smith and Dyar.—Very rare; four specimens only, 2 ♂ ♂, 2 ♀ ♀, June 15th to July 6th. I don't think any actual description of this has ever been published, but a Calgary ♀ (now the type) is mentioned in Smith and Dyar's Monograph, where the form is referred doubtfully to *insita*, Walk. Material sent Prof. Smith from here later confirmed his opinion as to the validity of *Canadensis* as a species. He returned me a ♀ "like ♀ type, but better marked," and a ♂ with maculation scarcely traceable. Taken at treacle. The type is in the U. S. National Museum.

133. *A. cretata*, Smith.—A ♂ June 22nd, 1901, and a ♀ July 6th, 1896, both, I believe, at treacle. Prof. Smith has seen the ♀. With so little material at hand, I am not in a position to question the distinctness of these two Calgary forms. I can only say that my *cretata* looks to me like my *Canadensis*, with much stronger and blacker maculation, and whiter and less powdered ground colour. I submitted to Sir Geo. Hampson the ♀ *Canadensis*, "like type," which was still labelled "*insita*, var. *Canadensis*," and a ♂ which closely resembled my ♀ *cretata* returned by Prof. Smith. His verdict was: "Your *insita* is quite a different species from Walker's *insita*, of which we have the type. It is *lepusculina*, Gn., ♀, and your *cretata* is the ♂ of it." My ♀ *cretata* is, however, exactly like Smith and Dyar's figure, and my ♂ is evidently the same species. The type is in the U. S. National Museum collection at Washington.

134. *A. Manitoba*, Smith.—A single ♀ July 1st, 1898, at treacle, which Prof. Smith has seen. It resembles Smith and Dyar's figure, but has paler primaries, and secondaries are somewhat smoky outwardly.

[NOTE.—The text refers to this figure as a ♀, but mentions the existence of two ♂ ♂ only.]

135. *A. quadrata*, Grote.—Has been fairly common some seasons at treacle. June and July.

136. *A. revellata*, Smith.—About the same as *quadrata* in dates and numbers, etc. Formerly referred to *grisea*.

137. *A. tartarea*, Smith.—Described in CAN. ENT., XXXV., 127 (May, 1903), from a ♂ taken at treacle near Calgary, on June 23rd, 1898, the only specimen I have ever seen. I had supposed it to be a dark *revellata*. The specimen is in the U. S. National Museum.

138. *A. illita*, Smith.—A single ♂, which Prof. Smith says is "more powdery than usual," at treacle on the Red Deer River, about fifty miles N. E. of Gleichen, June 20th, 1901, rather worn.

139. *A. emaculata*, Smith.—(Dyar's list, No. 1038, omitted from Smith's list in error). Common at treacle in "Acronycta" seasons, June and July. Larvæ on Salix and Rosa. I think the type is a ♂ from Calgary, and is in the Rutgers College collection. Formerly sent out as *impressa*.

140. *Apharetra pyralis*, Smith.—Described from Calgary. Very rare, one ♂ and three ♀ ♀ being all I ever took, July 13th to Aug. 23rd. Pl. XIII., fig. 11, in Smith and Dyar's Monograph, is the ♀ type, and not fig. 12, "male adult," as there stated. The specimen is figured also in Ent. News, VI., No. 10, Pl. XV. The type is in the U. S. National Museum at Washington.

141. *Hadenella tonsa*, Grt.—Redescribed partly from Calgary material as *subjuncta* (CAN. ENT., XXX., 323, Dec., 1898), and sent out by me previous to that as "*Bryophilid*, sp." Fairly common at treacle some years. July. The type of *subjuncta* is in the Museum at Washington.

142. *Caradrina extimia*, Walk.—July and August. Common.

143. *Caradrina miranda*, Grote.—Not common. Treacle and light. Middle June to middle July. Sir Geo. Hampson says it is "larger and darker than the typical form," so the species may perhaps be *nitens*, Dyar (CAN. ENT., XXXVI., 29, Feb., 1904).

144. *C. punctivena*, Smith.—Not at all common. June and July, treacle. One of the ♂ types is stated to be from "McLean, B. C." McLean is in Assiniboia, and 450 miles in a straight line from the B. C. boundary. Prof. Smith thinks that this may prove to be synonymous with *rufostriga*, Pack.

145.—*Hillia senescens*, Grt.
146. *H. vigilans*, Grt. } Both very rare previous to 1903, when I took about a dozen specimens of each at treacle in September. The form Prof. Smith calls *vigilans* is dark red, and except for the s. t. line and discoidal spots, almost unicolorous, with conspicuously pale whitish collar. *Senescens* is ochreous, tinged with reddish, and with all the maculation evident. I had always believed them distinct, but until last year had not sufficient material to enable me to press the point. I have now submitted a series of each to Prof. Smith, and he considers that the names must now stand for distinct species. The species sent out by me in some numbers seven or eight years ago as *crassis* turned out to be *Mamestra obscura*, a species somewhat similar in type of maculation to my *vigilans*, but without pale collar, and smaller and blacker. A ♂ taken on Aug. 1st, 1896, of size and general appearance of *vigilans*, but almost entirely black, with unicolorous collar, may perhaps have been the true *crassis*. Unfortunately this specimen was completely destroyed in transit to Rutgers College, and still requires to be duplicated. Breeding might prove *senescens* and *vigilans* dimorphic forms of one species, but I very much doubt it.

147. *H. algens*, Grt.—Generally distinctly rare, but, in company with the two foregoing species, fairly common at treacle last year, evidently a "Hillia" year. As a matter of fact, the other two species confined themselves to those fence posts treacled on a creek bottom, while *algens* seemed rather more fond of those on the hillside. September.

148. *Hadena (Luperina) niveivenosa*, Grt. Very rare. End July and August.

149. *H. (L.) passer*, Grt.—Very rare. End June and July.

(To be continued.)

## NOTE ON MACRONOCTUA ONUSTA, GRT.

The larvæ of this Noctuid moth were again found at Ottawa the past season, in beds of Irises, on the grounds of the Central Experimental Farm. They were not, however, at all numerous, and did not do any appreciable harm this year. Two larvæ were collected on July 28, one of which was inflated; the other pupated on Aug. 1, the moth emerging on Sept. 7. Another larva was found on Aug. 4, the moth appearing on Sept. 15. The pupa of the former specimen was much larger than any of those obtained in 1903, an account of which appeared in the last Annual Report of the Entomological Society of Ontario. This pupa measured 30 mm. in length and 7.5 in width. ARTHUR GIBSON.

## ON THE SYSTEMATIC POSITION OF THE ÆGIALITIDÆ.

BY H. F. WICKHAM, IOWA CITY, IOWA.

The family Ægialitidæ, then known by but one species, was placed by Dr. LeConte (Classification of the Coleoptera of North America, p. xxxvi.) in association with those Heteromera having the anterior coxal cavities closed behind. This structure is also assigned to *Ægialites* in the detailed account of the insect on page 388 of the same work. Dr. Sharp, in his recent treatise on insects (Cambridge Natural History, Vol. VI., p. 265), speaks of the anterior coxæ as being "completely closed in," while Dr. Geo. Horn, though dissecting a specimen for a study of the mouth-parts, seems to have overlooked the coxal structure, or he would certainly have alluded to it in his notes on the genus (Trans. American Ento. Soc., XV., p. 27). In view of the statements in the books, I was surprised, a few months ago, by the receipt of a letter from the Rev. J. H. Keen, in which he asserted that the cavities of the anterior coxæ are open behind, as is indeed the case. Mr. Keen's observation is of great importance, in that it opens the way to a proper appreciation of the systematic position of the insect.

Having been supplied with specimens of *Ægialites Californicus*, Mots. (*debilis*, Mann.), by Mr. Keen, and of *Æ. Fuchsii*, by Mr. Fuchs, I have been able to make careful dissections of both, and find that in neither case do the epimera reach the tip of the prosternum. There is thus left a gap of some extent, though the posterior aspect of the cavities is not open for its entire width as it is in *Pytho*. This being true, it becomes necessary to make a change in Dr. LeConte's table, removing Ægialitidæ from proximity to the Tenebrionidæ, and transferring them to group 4. Here they may be placed next to the Pythidæ, with which they agree in so many respects in larval as well as adult characters, and from which they may be distinguished by the greater number of ventral abdominal segments, there being six of these in *Ægialites* and but five in the Pythidæ.

To my mind, the sequence of Heteromerous families adopted in the LeConte and Horn "Classification" is not satisfactory, the Pyrochroidæ being too far removed from the Pythidæ. These families seem to me to be quite closely related, and I prefer the view presented by Dr. Sharp (l. c., p. 266), whereby they are placed in juxtaposition. If now, we place the Ægialitidæ between the Melandryidæ and the Pythidæ, I think we shall

have an arrangement that will do little violence to the affinities of these four families, as far as our present knowledge of the larval and adult structures allows us to judge.

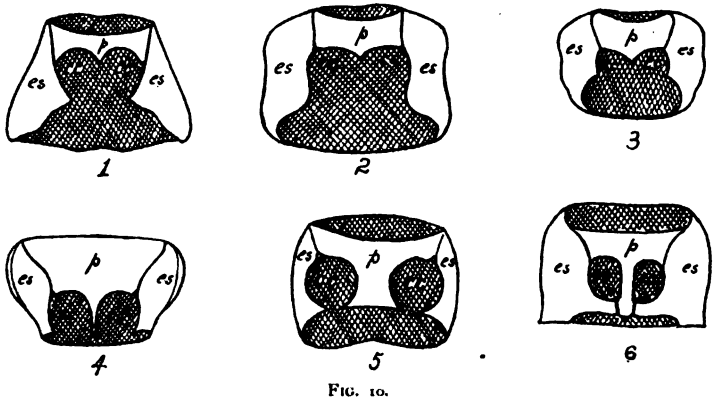


FIG. 10.

In order that the characters alluded to may be more readily appreciated, I have prepared sketches (Fig. 10), showing the structure of the under side of the prothorax in the Melandryidæ, Pyrochroidæ, Pythidæ, Ægialitidæ and Tenebrionidæ. 1 represents *Melandrya striata;* 2, *Pyrochroa flabellata;* 3, *Pytho Americana;* 4, *Lecontia discicollis;* 5, *Ægialites Californicus;* and 6, *Nyctobates Pennsylvanica.* All are lettered alike, *p* indicating the prosternum, *cc* the coxal cavities, and *es* the thoracic side pieces, the sutures between the episterna and epimera being obliterated or indistinct.

## THE BEE-GENUS APISTA, ETC.

When writing (p. 330) on the genus *Apista*, F. Smith, 1861, I unfortunately overlooked the fact that the generic name is long preoccupied (*Apista*, Hübn, 1816, and the similar *Apistus*, Cuvier, 1829). The bee-genus from Brazil may therefore be known as *Egapista*, n. n., type *Egapista opalina* (*Apista opalina*, Smith).

I find that the name of the African bee-genus *Serapis*, F. Smith, 1854, is also preoccupied (*Serapis*, Link, 1830); it may be changed to *Serapista*; type *Serapista denticulata* (*Serapis denticulatus*, Smith).

The name *Eumorpha* proposed by Friese for a group of bees, is also preoccupied. The group *Rhodocentris*, Friese, includes the type of the prior *Heterocentris*, Ckll.; so the latter name must be used for the group, unless (as seems probable) it can be divided. T. D. A. COCKERELL.

## THE NYMPH OF *GOMPHUS FURCIFER*, HAGEN.

BY E. M. WALKER, B. A., M. B., TORONTO.

On the 18th of June, 1904, while collecting dragon-fly nymphs in Grenadier Pond, Toronto, I found two *Gomphus* exuviæ resting on the surface of a thick growth of algæ a few feet from the edge of the pond. I examined the debris and black swamp mud from the bottom, just below the spot where the skins were taken, and found one nymph about two-thirds grown, apparently of the same species. On June 20th I found another exuvia on a similar part of the shore, and on examining the bottom I found several half-grown nymphs and one full-grown one, which was crawling along the surface of the algæ, evidently ready to transform. In the evening a male *Gomphus furcifer* emerged.

Since then I have taken several half-grown nymphs, but as the season for transformation was apparently over I got no more mature ones. All of the nymphs were found in the surface mud, at a depth of about one or two feet of water, the shore being low and marshy. I have kept one of the nymphs alive ever since.

The imagoes of *Gomphus furcifer* are not rarely taken in the country surrounding Grenadier Pond, and I have one female from De Grassi Pt., Lake Simcoe. It has always been considered an uncommon species, and the nymph was hitherto unknown.

FIG. 11.—Nymph of *Gomphus furcifer*. (Enlarged 1½ diameters.)

Nymph of *Gomphus furcifer* (Figs. 11 and 12).

Body elongate, depressed, covered with minute dense brownish scurfy pubescence; the legs very sprawling. Abdomen lanceolate, broadest at the fourth segment, the lateral margins as far as the apex of segment 8 regularly convex; segments 9 and 10 very long and narrow, together equal in length to segments 6, 7 and 8. Segment 8 nearly twice as broad at base as at apex, about two-thirds as long as segment 9. Segment 9 about three-fifths as broad at apex as at base, about as long as segment 10 with the appendages. Segment 10 equal in breadth throughout. Small lateral spines are present on segments 8 and

9, very minute on the former; otherwise the lateral margins are smooth and free from hair. Dorsal surface of abdomen as far as base of segment 6 evenly convex from side to side with a very faint median ridge, along which is a faintly impressed line; beyond this the ridge is somewhat more distinct and the sides slope more abruptly. The "scars," or irregular bare patches, on the dorsal surface of the abdomen are conspicuously marked on segment 1–8, and are represented on 9 by a pair of distinctly impressed lines. Width of metathorax about equal to that of the first abdominal segment. Wing-cases extending a little over the base of the fourth abdominal segment. Legs thinly fringed on both anterior and posterior margins with rather long hairs, except the posterior margins of all the tibiæ, which bear a rather dense fringe. Antennæ with the third joint about one-third longer than the first and second joints together, slightly broader at apex than at base. Mentum of labium about one-third longer than broad and a little more than two-thirds as broad at base as at apex, contracted in its basal two-fifths. Median lobe distinctly produced, the anterior border convex and bearing on its margin a dense fringe of short flat, light brownish hairs, in the midst of which at the apex is a pair of very small, shining, dark brown teeth, which are seen with some difficulty. Lateral lobes with the outer margins very convex, apex with a prominent hook and about six other nearly equidistant teeth along the inner margin, the basal one very small, the others prominent and of about equal size.

FIG. 12.—Labium, from beneath, of *Gomphus furcifer* nymph.

Total length, 33 mm.; abdomen, 22.5 mm.; hind femur, 6 mm.; width of head, 5.75 mm.; of abdomen, 7 mm.

## NOTE ON HAPLOA CONTIGUA, WALK.

When I was working on the Haploas, previous to the publication of my paper on "The North American Callimorphas" (CAN. ENT., XIX., 181–191), I appealed to Mr. A. G. Butler for information in regard to Walker's types, and he very kindly sent me sketches of the types of *Contigua* and *Confinis* as then standing in the British Museum collection, but as what was shown as the former was practically the same as the latter, I wrote that I thought there must be some mistake, and sent a drawing of what we, in this country, understood to be *Contigua*. Mr. Butler, in replying,

said I was quite right, and that Mr. Walker, with his usual carelessness, had got the *Contigua* label on the wrong specimen, and thanked me for calling his attention to the error, which he had corrected.

At the Annual Meeting of the Ent. Soc. of Ont., 26th and 27th October this year, I saw for the first time the D'Urban collection of moths deposited in November, 1871, in which I found a specimen of *Contigua* marked *Confinis* in Walker's handwriting, as confirmed by Dr. Bethune. This shows that Walker had confused his own species of these moths very badly.

HENRY H. LYMAN, Montreal.

## POGONOMYRMEX OCCIDENTALIS.

On page 351 of this magazine Professor Cockerell notes his observation of the *Pogonomyrmex occidentalis* at Ruleton, within twelve miles of the western limit of Kansas, and considers this as the indication of the eastern limit or beginning of the arid region. Our investigations of the range of this large ant in Kansas have shown us that its eastern limit is found far to the east of the point mentioned. The species occurs as far east in this State as the Sixth Principal Meridian, or in the counties of Republic, Ottawa, McPherson and Sedgwick, on a line about two-fifths of the length of the State from the eastern border. One would scarcely be acquainted with climatic conditions in Kansas who should consider this ant as a mark of the "arid region," as west of the line indicated are found some of the best farming lands of the State. Especially is this true of the wheat lands, as the counties named are among those famous for the production of this cereal. Notwithstanding its occasional occurrence along the extreme eastern limit above indicated, the favoured home of the species is really within the western hundred miles of the State, and thence west to the mountains, where in specially suitable localities it sometimes occurs in astonishing abundance. From its habit of clearing about its mounds a considerable space of vegetation, this ant is not liked by farmers, and various measures have been taken to destroy it, one of the most successful being the pouring into the centre of the formicary, opened for the purpose, a quantity of carbon bisulphide, the opening being then closed to retain the fumes, which finally penetrate to the depths of the burrows, destroying the inmates. As these cleared spaces sometimes attain the diameter of twenty-four feet, and as the hills may occur a few rods apart, it will be seen that the ant is not a desirable occupant in cultivated fields. However, it is well known that regular cultivation of the soil of infested fields is a great deterrent to their occupation by the Pogonomyrmex, perhaps less through the dislodgment of well-established colonies than through the discouragement of new ones. Thus it comes to be true that in fields properly handled the ant ceases to be a general pest, and the few large colonies are readily destroyed by the means above indicated. The species is therefore economically of less importance than is sometimes believed.

E. A. POPENOE, Manhattan, Kan.

Mailed December 12th, 1904.

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## CORRIGENDA.

Page 144, line 19, for "Spring methods" read "Spinning methods."
Page 333, line 2, for "BORTANA" read "BOTRANA."

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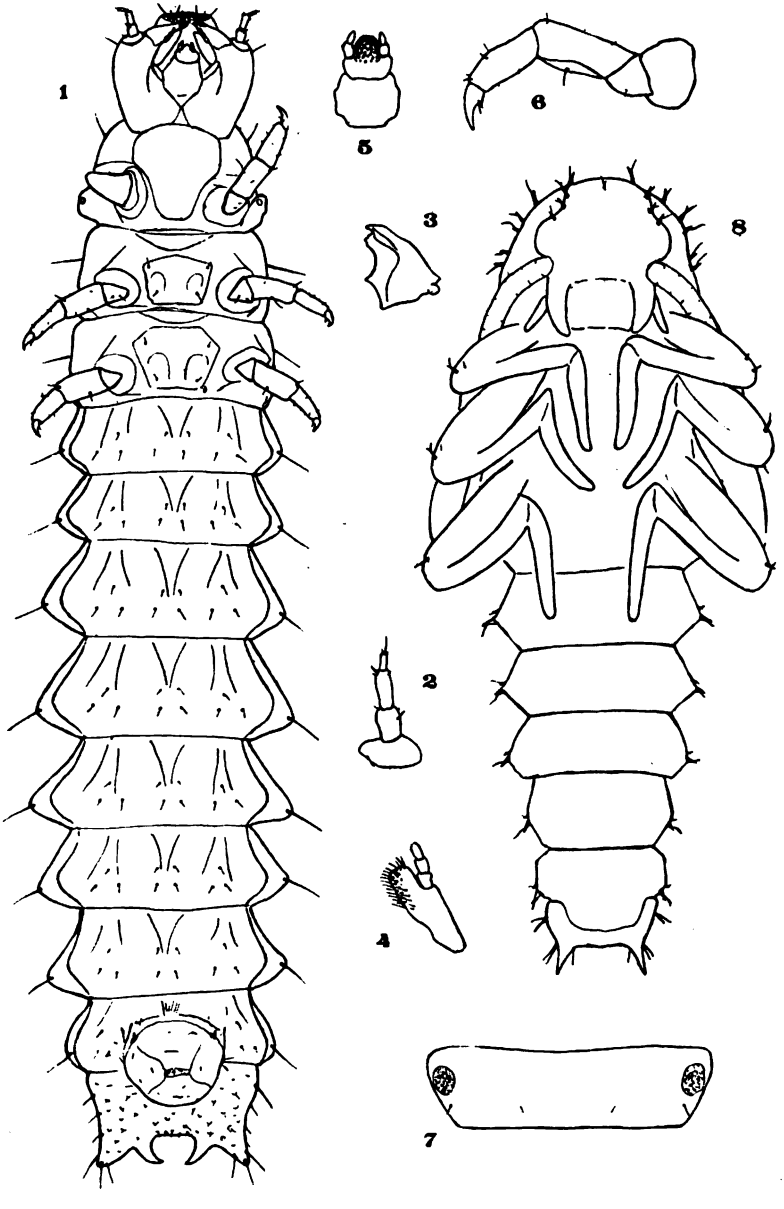


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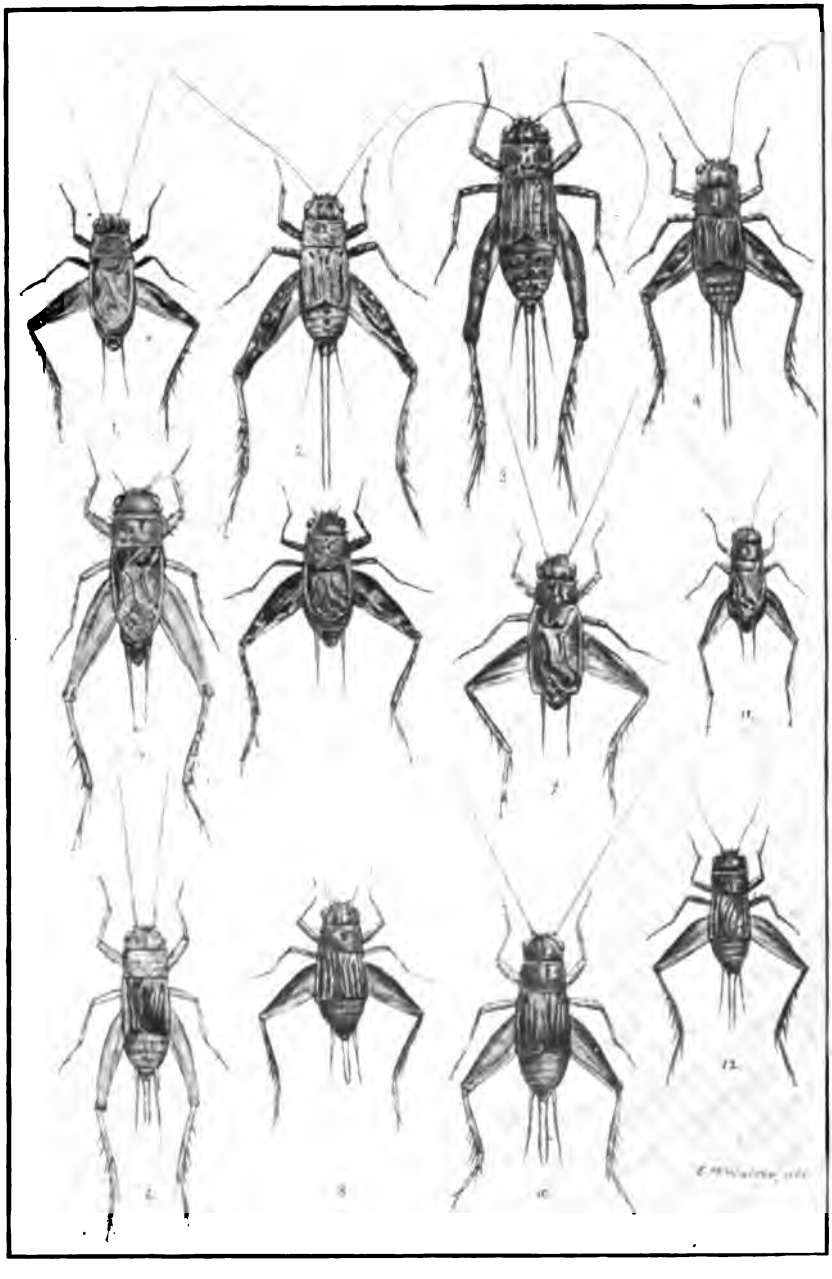

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